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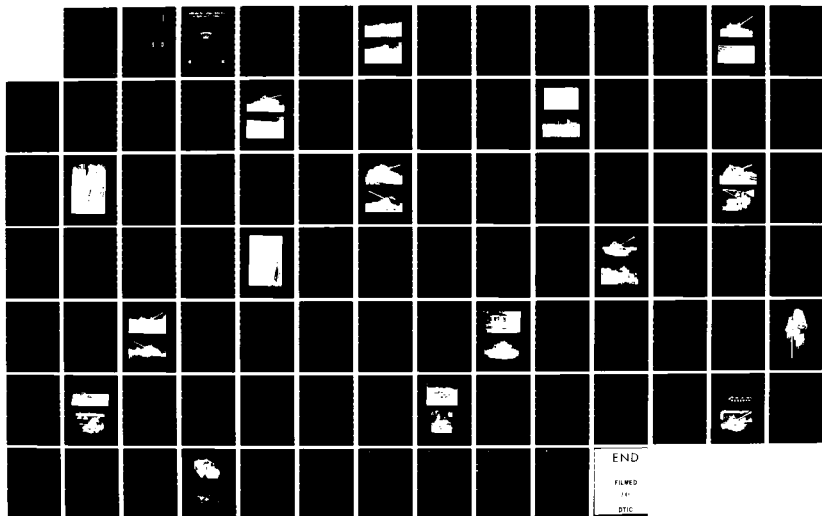
COMPARATIVE CHARACTERISTICS OF MAIN BATTLE TANKS(U)  
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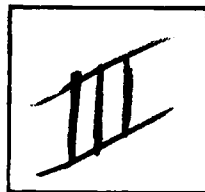
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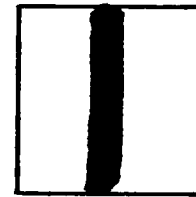
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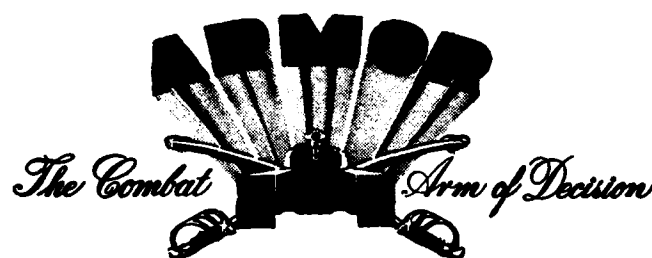
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# COMPARATIVE CHARACTERISTICS OF MAIN BATTLE TANKS

AD A123413



**U'S ARMY ARMOR SCHOOL**  
**FORT KNOX, KENTUCKY**  
**JUNE 1973**



**DISTRIBUTION STATEMENT A**

Approved for public release  
Distribution Unlimited

## Foreword

The purpose of this booklet is to provide a ready reference of the principal main battle tanks of the world. Aiming at the company, troop, battery level of professional interest, it concentrates on the vehicle's ability to shoot, move, and communicate, and avoids the technically esoteric. While the varying thicknesses of armor plate are interesting, for example, and unclassified data is available if one looks hard enough, that data would have meaning only if it was discussed within the many parameters of armor plate design. For this publication it is sufficient to know that the thicknesses, quality, and placement of armor are similar from tank to tank, regardless of country of manufacture.

In order not to exclude a large part of the interested audience, the principal research effort has been directed at collecting, checking, and producing unclassified data. Since any figure within this book could have been found by anyone with the interest and time, there is no reason for restricting the dissemination of this booklet. Classification and data reliability are two different things, and in a continuing effort to keep up to date, we welcome and solicit documented corrections from users.

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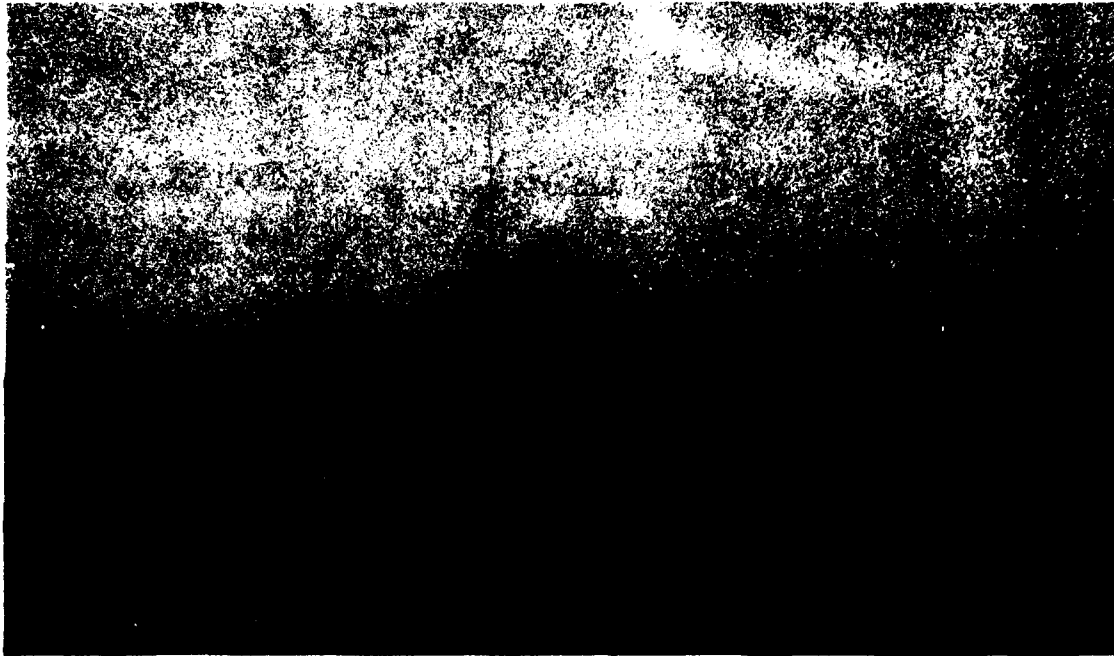


Figure 1-1. AMX-30. (Side view.)

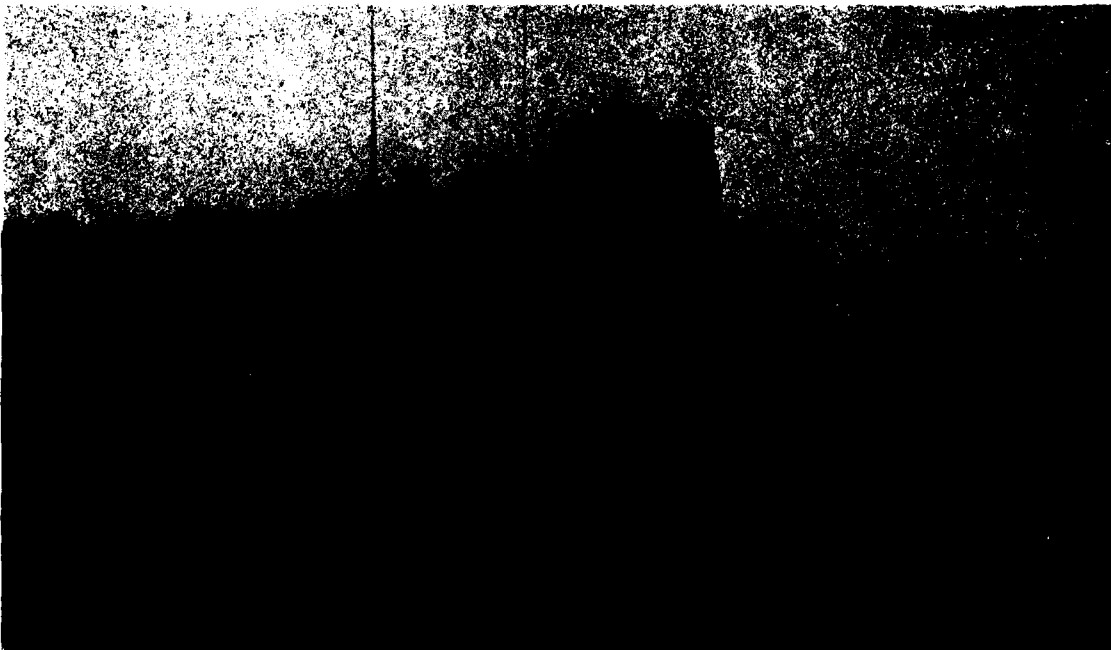


Figure 1-2. AMX-30. (Rear view.)

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### **AMX-30 (France)**

When in 1961 the Direction Technique des Armes Terrestres designed the AMX-30, it brought to an end the 1956 attempt by France, Germany, and Italy to build a joint-European tank. Full production started in 1966, at a rate of 10 per month, and in 1967, the first French units began to receive the tank. The AMX-30 is known or believed to be on order to Iraq, Peru, Libya, and Spain. Its designation derives from the builder's location: Atelier des Constructions d'Issy-les-Moulineaux.

#### **DIMENSIONAL STATISTICS**

Crew	4
Combat Weight	39.6 tons
Unloaded Weight	37.4 tons
Ground Pressure (Combat Loaded)	10.9 psi
Power-to-Weight Ratio	17.7 bhp/ton loaded
Length, Gun Forward	31.17 feet
Length of Hull Over Tracks	21.6 feet
Width	10.02 feet
Height to Topmost Point	9.4 feet
Height to Turret Roof	7.5 feet
Ground Clearance	1.45 feet
Width of Track	1.87 feet
Fuel Capacity	256 US gallons in 6 tanks

#### **PERFORMANCE**

Maximum Road Speed	40.3 mph
Road Range	400 miles
Maximum Gradient	60%
Maximum Tilt	17°
Maximum Step	3.05 feet
Maximum Trench	9.5 feet
Fording Depth	Ford up to 6.5 feet, snorkel up to 13.0 feet, preparation time for snorkel @ 15 minutes



### POWER TRAIN

Engine Type	Hispano Suiza HS 110, flat 12 cylinder opposed, supercharged diesel
Engine hp	710 hp @ 2,600 rpm (SAE)
Maximum Torque/rpm	1,623 lb/ft @ 2,000 rpm
Type Cooling	Liquid, 26.4 gallons
Second Engine	None
Number Gears Forward/Reverse	5 forward, top 4 are synchronized/1 reverse
Turning Radius	10.17 feet in first gear
Driver's Steering Controls	Steering levers (laterals)

### SUSPENSION

Type	Torsion bars, suspended dead track
Number Shock Absorbers per Side	1 per set of road wheels, except middle set
Road Wheels/Support Wheels per Side	5 pairs/5

### ARMAMENT

Primary Armament	105-mm rifled gun
Length of Tube	19.4 feet
Bore Evacuator/Muzzle Brake	No/No, compressed air evacuates tube
Thermal Tube Jacket	Rigid plastic
Type Ammunition/Muzzle Velocity	HEAT--3,048 fps HE--2,300 fps
Maximum Sustained Rate of Fire	8 rounds per minute
Total Rounds Carried/Rounds in Ready Rack	50/22/+18 in bustle
Secondary Armament	Coax cal .50 Browning, 700 rounds total; to be replaced by 1976 by 20-mm cannon
AA Armament	7.62-mm at TC hatch; 1,950 rounds total, maximum elevation +40°, 360° traverse
Smoke Projection/Number of Dischargers	2 dischargers per side, requires 8 sec for smoke buildup, can discharge for 45 seconds

### FIRE CONTROL

Turret Power Control	Electro-hydraulic
By Commander/Gunner	Gunner
Maximum Rate Power Traverse	360° in 12-13 seconds
Gun Depression/Elevation	-8°/+20°
Commander's Override/Fire Control Override	Yes/Yes
Gun Stabilizer/Vertical/Horizontal	No/Not aval
Range Finder/Type	Optical coincidence; laser is planned
Magnification	12x
Range	15-3,500 meters
Range Setting Device	Optical
Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Monocular optical with tilt compensator/8x
Gunner's Secondary Sight (Type/Magnification)	2 periscopes
Commander's Sight/Magnification	(Through range finder/12x; can use range finder as telescope 6x, binocular device/10x)
Periscopes or Vision Blocks	Vision blocks

### NIGHT CAPABILITY

Searchlight/Type	Large white/IR on mantlet
Light Source/Planning Range	White: 1,200 meters; IR: 800 meters; Similar to M60 light
Gunner's Night Sight/Magnification/Range	IR/5.4x/limited by range of IR searchlight
Commander's Night Sight/Magnification/Range	IR/4.1x/limited by range of IR searchlight
Commander's Searchlight	White and IR, located on commander's AA gun; white: 700 meters; IR: 500 meters
IR Driving Light/Driver's Sight/Range	Yes/Yes/similar to US vehicles

### NBC PROTECTION

Overpressurization, filtered air; two chemical decontamination bottles; radiation detection device; hermetical seal; warning light.

### COMMUNICATIONS

The vehicle is commonly configured with the following communications system:

Radio Model/AM/FM	FM: TRVP-13, TRVP-113
Band Width/Number Channels/Range	26 to 71.95 MHz/920 channels/up to 15 miles
External Phone	Yes
Intercom	Yes

### EXTRAS

Heaters	For crew compartment; also for oil to facilitate cold starts cold air conditioner
Hull Escape Hatch	Yes
Drinking Water Capability	Not avail
Fire Fighting Equipment	3 portable extinguishers; 1 CO2 bottle in engine compartment
Fire Warning System	Automatic, light and audible warning
Navigation Aids	No
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	None

### FAMILY OF VEHICLES

AMX-30 export model; not fitted with NBC, infrared, snorkel equipment.

Bridge layer; tested in 1971. 72 feet, class 50 bridge, loaded weight 89,000 pounds.

Recovery/grader; crew of four, 7.62-mm mg; hydraulically operated dozer blade; 35-ton hoist, 10-ton slewing crane; can carry a spare engine.

Pluton missile carrier; missile range 9.6-120 km.

Twin, 30-mm AA gun platform, Doppler radar, acquisition range 150 km.

### SUMMARY

At 39.6 tons, this is the lightest modern main battle tank in service. It is highly mobile, but affords very limited protection for a rather cramped crew. The French recruit tankers from the shorter men, which may offset this fatigue factor somewhat. HEAT is the sole main gun munition; while the cone diameter of the shaped charge is reduced by the counter-rotating mechanism, which in turn reduces the round's effectiveness, the comprehensive fire control system ensures a quick first-round hit.



Figure 2-1. Leopard I. (Front view.)

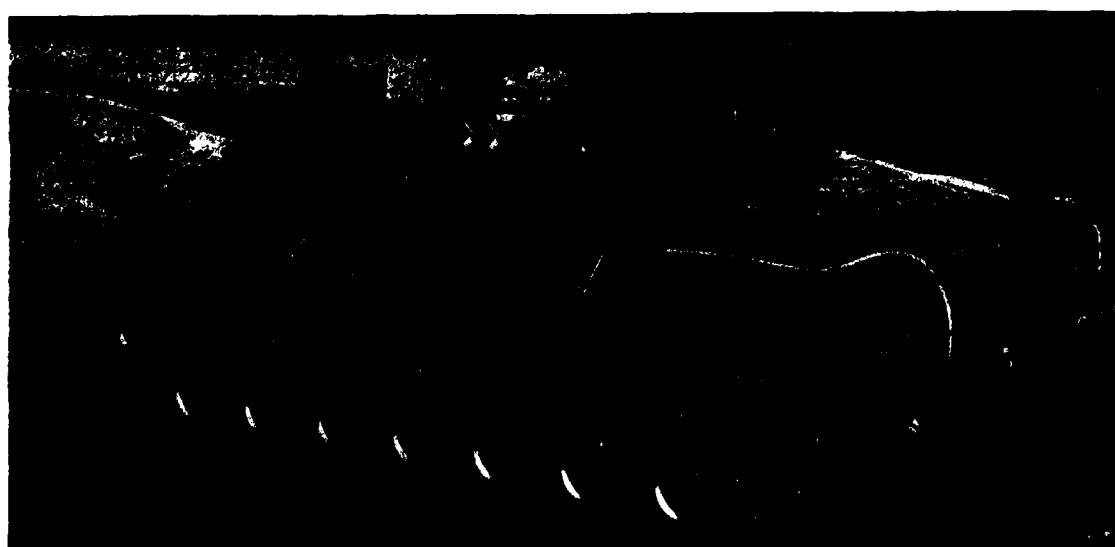


Figure 2-2. Leopard I. (Rear view.)

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## LEOPARD I (Germany)

When France abandoned the joint project with Italy and Germany and started development of the AMX-30, Germany began developing the 1961 design submitted by Dr. Porsche. Krauss-Maffei AG delivered the first production model in September 1965. Models were tested for possible purchase by Britain, Italy, Netherlands, Belgium, and Australia.

### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	44.25 tons
Unloaded Weight	40.5 tons
Power to Weight	19 bhp/ton combat loaded
Ground Pressure (Combat Loaded)	12.2 psi
Length, Gun Forward	31.3 feet
Length of Hull Over Tracks	22.8 feet
Width	10.8 feet
Height to Topmost Point	8.7 feet
Height to Turret Roof	7.6 feet
Ground Clearance	1.49 feet
Width of Track	1.8 feet
Fuel Capacity	319 US gallons

### PERFORMANCE

Maximum Road Speed	40.5 mph
Road Range	375 miles
Maximum Gradient	60%
Maximum Tilt	17°
Maximum Step	3.74 feet
Maximum Trench	9.5 feet
Fording Depth	Ford up to 7.4 feet, snorkel 13.1 feet, preparation time for snorkel @ 10 minutes

### POWER TRAIN

Engine	Mercedes-Benz 4-stroke diesel, 10-cylinder, 90° V upright
Engine hp	830 hp @ 2,200 rpm
Maximum Torque/rpm	1,989 ft/lb @ 1,200 rpm
Type Cooling	Liquid @ 25 gallons
Second Engine	None
Number Gears Forward/Reverse	Automatic transmission, limited slip, 4 forward/1 reverse
Turning Radius	From pivot steer to infinity
Driver's Steering Controls	Steering controls similar to US tanks

### SUSPENSION

Type	Torsion bar, suspended live track
Number Shock Absorbers per Side	5 front 3 and last 2 road wheels
Road Wheels/Support Rollers per Side	7 pairs/4

### ARMAMENT

Primary Armament	105-mm rifled gun
Length of Tube	16 feet
Bore Evacuator/Muzzle Brake	Yes/No
Thermal Tube Jacket	No
Type Ammunition	APDS HESH SMOKE
Maximum Sustained Rate of Fire	6 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	60/3
Secondary Armament	Coaxial machinegun, 7.62-mm
Rounds carried	4,800
Maximum effective range	1,100 meters
AA Armament	Same as coax; mounted at TC station
Smoke Projection/Number of Dischargers	4 per side, 16 spare smoke grenades are carried.

### FIRE CONTROL

Turret Power Control	Electro-hydraulic
By Commander/Gunner	Gunner, TC override
Maximum Rate Power Traverse	360° @ 11 seconds
Gun Depression/Elevation	-9°/+20°
Commander's Override/Fire Control Override	Yes/Yes
Gun Stabilizer/Vertical/Horizontal	Cadillac-Gage system to be fitted
Range Finder/Type	Both stereoscopic and coincidence
Magnification	16x-8x for auxiliary range finder
Range	4,000 meters
Range Setting Device	Gunner's range finder
Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Periscope/8x
Gunner's Secondary Sight (Type/Magnification)	Telescope/8x (auxiliary range finder)
Commander's Sight/Magnification	Vertical monocular periscope/from 6x to 20x
Periscopes or Vision Blocks	Rotatable periscope and vision blocks

### NIGHT CAPABILITY

Searchlight/Type	Xenon arc
Light Source/Planning Range	White light/1,500 meters
Gunner's Night Sight/Magnification/Range	IR/8x @ 800 meters
Commander's Night Sight/Magnification/Range	Day sight can be replaced by passive IR binoculars
Commander's Searchlight	Twin spotlights on TC cupola
IR Driving Light/Driver's Sight/Range	White and IR driving lights/yes/50 meters

NB: IR protective coating makes tank difficult to detect using IR devices.



### NBC PROTECTION

Filtered air, overpressure system

Radio active dust filter is planned

### COMMUNICATIONS

The vehicle is commonly configured with the following communications system:

Radio Model/FM	FM SEM 25
Band Width/Number Channels/Range	26-70 MHz in 50-kHz spacings; 880 channels/20 miles maximum
External Phone	Yes
Intercom	Yes
Other Equipment	Tank can accept two SEM 25 transceivers plus one EM 25 receiver

### EXTRAS

Heaters	Yes, also carries a hotplate
Hull Escape Hatch	Yes
Drinking Water Capability	Yes
Fire Fighting Equipment	Fixed: 1-gallon CO2 bottle behind loader. Portable: 4 hand-held, behind driver
Fire Warning System	Graviner fine wire, independent of master switch
Navigation Aids	Gyrocompass is planned
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	Rearview mirror on each front fender

### FAMILY OF VEHICLES

1. Armored recovery vehicle, with dozer blade, 33-foot cable on 30-ton winch, crane traverse 270°, carries spare engine, crane capacity 20 tons.
2. Bridge laying vehicle, class 50 bridge, 72 feet, 13 feet wide.

3. AA vehicle, two versions being considered:

a. Twin 30-mm, effective to 3,000-meter altitude, ammunition capability 1,300 rounds, doppler radar.

b. Twin 35-mm Oerlikon, effective to 3,500-meter altitude.

4. Armored pioneer vehicle, similar to recovery vehicle, but has earth boring tool; dozer blade can be fitted with excavating teeth.

#### SUMMARY

The Leopard is agile in spite of its weight, and is as easy to drive as a car because of its well thought-out controls. As a base for further refinement, it may well become an extremely sophisticated tank. At the present cost of @ 1 million dollars US, it should also be one of the most expensive. Its tactical planning capabilities are enhanced by the fact that the recovery vehicle carries a spare engine as part of its normal equipment, and that the pack can be exchanged under field conditions in about 90 minutes--30 minutes under ideal conditions.



Figure 3-1. STB in action.

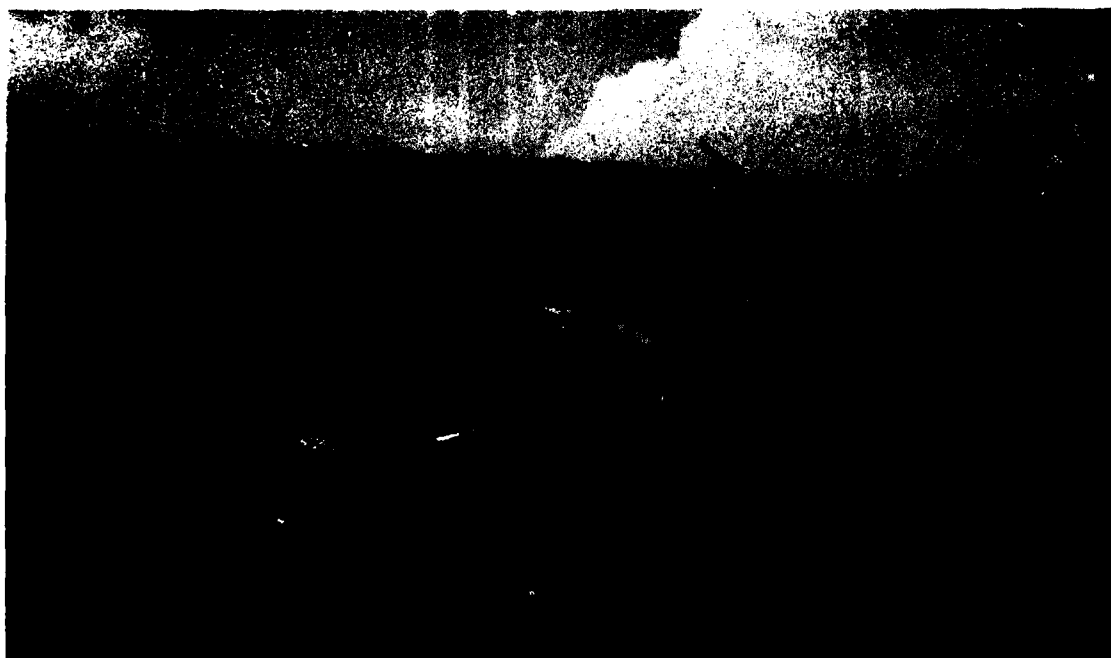


Figure 3-2. STB. (Front view.)

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### STB (Japan)

This tank of advanced design with a good ballistic shape is of Japanese manufacture with the exception of the 105-mm Vicker's gun. This vehicle is still under test.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	41.9 tons
Unloaded Weight	39.5 tons
Power-to-Weight Ratio	17.9 bhp/ton
Ground Pressure (Combat Loaded)	11.4 psi
Length, Gun Forward	Not aval
Length of Hull Over Tracks	21.6 feet
Width	10.5 feet
Height to Topmost Point	10.1 feet
Height to Turret Roof	7.35 feet
Ground Clearance	2.33 feet
Width of Track	Not aval
Fuel Capacity	185 gallons

#### PERFORMANCE

Maximum Road Speed	43 mph
Road Range	310 miles
Maximum Gradient	60%
Maximum Tilt	27°
Maximum Step	39.7 in
Maximum Tranch	8.2 feet
Fording Depth	NA* (swims)

\*Not applicable

### POWER TRAIN

Engine Type	V10/90°/Diesel
Engine hp	750 bhp
Maximum Torque/rpm	Not aval
Type Cooling	Air-cooled
Second Engine (hp and Purpose)	None
Number Gears Forward and Reverse	6 forward/1 reverse
Turning Radius	Neutral steer
Driver's Steering Controls	Handlebar

### SUSPENSION

Type	Hydropneumatic variable suspension, non-supported, dead track
Number Shock Absorbers per Side	NA
Road Wheels/Support Wheels per Side	Five Road wheels no support wheels

### ARMAMENT

Primary Armament	105-mm, rifled main gun
Length of Tube	17.6 feet
Bore Evacuator/Muzzle Break	Yes/No
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	APDS--4, 820 fps HESH--2, 400 fps
Maximum Sustained Rate of Fire	6 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	50/9
Secondary Armament	7.62-mm, coaxially mounted machinegun
Rate of Fire	Not aval
Rounds Carried	Not aval
Maximum Effective Range	Not aval

AA Armament	12.7-mm machinegun in front of commander's hatch
Rate of Fire	Not aval
Rounds Carried	Not aval
Maximum Effective Range	Not aval
Smoke Projection/Number of Dischargers	6 smoke dischargers

#### FIRE CONTROL

Turret Power Control	Electrical-hydraulic and manual
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	Not aval
Gun Depression/Elevation	-5°/+15°
Commander's Override/Fire Control	Yes
Gun Stabilizer	Yes
Range Finder-Type	Yes/laser
Magnification	Not aval
Range	Not aval
Range Setting Device	Not aval
Elevation Quadrant	Not aval
Traverse (Azimuth) Indicator	Not aval
Traverse (Azimuth) Indicator	Yes
Gunner's Sight	Periscope
Gunner's Secondary Sight	Telescope
Commander's Sight/Magnification	Periscope linked to gunner's sight through a computer
Periscopes or Vision Blocks	Periscopes

#### NIGHT CAPABILITY

Searchlight/Type	Not aval
Light Source/Planning Range	Not aval

Gunner's Night Sight/Magnification/Range	Not aval
Commander's Night Sight/Magnification/Range	Not aval
Commander's Searchlight	Not aval
IR Driving Light/Driver's Sight/Range	IR headlights

#### NBC PROTECTION

The tank is fully sealed. It has an air filtration unit fitted externally at the rear of the turret.

#### COMMUNICATIONS

The vehicle is commonly configured with two VHF radios.

Radio Model/AM/FM	Not aval
Band Width/Number Channels/Range	Not aval
External Phone	Yes
Intercom	Not aval
Other Equipment	Not aval

#### EXTRAS

Heaters	Not aval
Hull Escape Hatch	Not aval
Drinking Water Capability	Not aval
Fire fighting Equipment	Not aval
Fire Warning System	Not aval
Navigation Aids	Not aval
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	Not aval

#### SUMMARY

The STB has excellent mobility and good ballistic shape, but its relatively light weight precludes good armor protection. The variable suspension enhances the mobility of the STB.



Figure 4-1. STRV-103. (Top front view.)



Figure 4-2. STRV-103 with erectable barriers.

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**STRV-103 (Sweden)**  
**(S-tank)**

The STRV was introduced into service in Sweden in 1967. It was designed to have a powerful gun, good armor protection, a small, low silhouette, and a swimming capability.

**DIMENSIONAL STATISTICS**

Crew	3
Combat Weight	43.0 tons
Unloaded Weight	40.8 tons
Power-to-Weight Ratio	17.0 bhp/ton
Ground Pressure (Combat Loaded)	12.7 psi
Length, Gun Forward	29.5 feet
Length of Hull Over Tracks	23.0 feet
Width	11.8 feet
Height to Topmost Point	6.24 feet
Height to Turret Roof	Not avail
Ground Clearance	1.33 feet
Width of Track	2.14 feet
Fuel Capacity	254 gallons

**PERFORMANCE**

Maximum Road Speed	31 mph
Road Range	210 miles
Maximum Gradient	58%
Maximum Tilt	31°
Maximum Step	3.6 feet
Maximum Trench	7.5 feet
Fording Depth	Swims

### POWER TRAIN

Engine Type	Primary--6-cylinder/opposed/diesel Secondary--gas turbine
Engine hp	730 hp for both engines
Maximum Torque/rpm	375/2,400 ft-lbs/rpm
Type Cooling	Liquid
Second Engine	The gas turbine engine is used to augment the primary engine, assist in cold weather starts, and act as power source when the primary engine is malfunctioning.
Number Gears Forward and Reverse	2 forward/2 reverse
Turning Radius	Low ratio--90 feet High ratio--225 feet (high speed, controlled pivot turns)
Driver's Steering Controls	Handlebars on column Driving and gun control unit is integrated

### SUSPENSION

Type	Hydropneumatic, suspended dead track
Number Shock Absorbers per Side	NA
Road Wheels/Support Wheels per Side	4 pairs/2 support wheels
Primary Armament	105-mm, rifled main gun
Length of Tube	20.01 feet
Bore Evacuator/Muzzle Break	Yes/No
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	APDS--1,500 fps HE--Not aval SMOKE--Not aval
Maximum Sustained Rate of Fire	15 rounds per minute (automatic loader)
Total Rounds Carried	50 in magazine
Secondary Armament	2 coaxially mounted 7.62-mm machineguns
Rate of Fire	700-900 rounds per minute

Rounds Carried	1,000 rounds
Maximum Effective Range	1,100 meters
AA Armament	7.62-mm machinegun mounted on commander's cupola
Rate of Fire	700-900 rounds per minute
Rounds Carried	500 rounds
Maximum Effective Range	1,100 meters
Smoke Projection/Number of Dischargers	8 WP smoke dischargers

#### FIRE CONTROL

Turret Power Control	No turret--stabilized cupola
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	NA (no turret) traverse the gun by moving vehicle
Gun Depression/Elevation	-10°/+12°
Commander's Override/Fire Control Override	Yes--dual driving and firing capability
Gun Stabilizer	No
Range Finder Type	Yes/Laser
Magnification	Not aval
Range	Not aval
Range Setting Device	Graticules
Elevation Quadrant	Not aval
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Binocular/1x, 6x, 10x, 18x
Gunner's Secondary Sight (Type/Magnification)	Unity periscope
Commander's Sight/Magnification	Binocular/1x, 6x, 10x, 18x
Periscopes or Vision Blocks	Vision blocks

### NIGHT CAPABILITY

Searchlight/Type	Not aval
Light Source/Planning Range	Not aval
Gunner's Night Sight	Not aval
Commander's Night Sight	Not aval
Commander's Searchlight	Not aval
IR Driving Light/Driver's Sight/Range	Not aval

### NBC PROTECTION

Crew members have gas masks. Armored shutters can be lowered over sights.

### COMMUNICATIONS

The vehicle is commonly configured with the following communications system:

Radio Model/AM/FM	AN/VRC-12/FM
External Phone	Not aval
Intercom	Not aval
Other Equipment	Throat microphones

### EXTRAS

Personnel Heater	Yes
Hull Escape Hatch	Not aval
Drinking Water Capability	Not aval
Fire fighting Equipment	Two extinguishers in engine compartment. Two portable extinguishers.
Fire Warning System	Not aval
Navigation Aids	Not aval
Provisions made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	Not aval
Dozer Blade	Available and can be fitted on the vehicle

### FAMILY OF VEHICLES

None

### SUMMARY

This vehicle was designed for use primarily in Sweden. The absence of a turret enables the height to be kept to a minimum. The fixed gun mounting has made it possible to use an automatic loader. The dual engine configuration offers the advantages of an extra engine in case of breakdown, cold weather starting capability, and more power for short periods. The disadvantages of the dual engine system are increased fuel consumption and slower response in acceleration. The integrated steering/gun control unit enables the commander or gunner to drive the vehicle and/or fire the main gun. The gun is laid for direction by reorienting the vehicle and is laid for elevation by altering the pitch of the hull. The disadvantage of this system is inability to fire to the flanks.



Figure 5-1. PZ61. (Rear view.)

June 1973

### PZ61/68 (Switzerland)

The first Swiss tanks were produced in 1958 and designated the PZ58. The 105-mm gun was added to this tank and it became the PZ61. The first PZ61 tanks were produced in 1966 in Switzerland (the engine was manufactured in the Federal Republic of Germany). Modifications that increased the output of the engine and added rubber padded tracks resulted in the PZ61 being redesignated the PZ61/68.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	43.0 tons
Unloaded Weight	41.9 tons
Power to Weight Ratio	17.0 bhp/ton
Ground Pressure (Combat Loaded)	12.1 psi
Length, Gun Forward	31.2 feet
Length of Hull Over Tracks	22.6 feet
Width	10.3 feet
Height to Topmost Point	9.0 feet
Height to Turret Roof	8.9 feet
Ground Clearance	1.31 feet
Width of Track	1.64 feet
Fuel Capacity	165 gallons

#### PERFORMANCE

Maximum Road Speed	37 mph
Road Range	186 miles
Maximum Gradient	70%
Maximum Tilt	27°
Maximum Step	2.6 feet
Maximum Trench	8.5 feet
Fording Depth	Without prep 3.6 feet, with prep 7.6 feet

### POWER TRAIN

Engine Type	V8 diesel
Engine hp	730 bhp
Maximum Torque/rpm	1,750 ft-lbs/1,800 rpm
Type Cooling	Liquid
Second Engine	The 35-hp engine is used for the main generator drive and auxiliary drive.
Number Gears Forward and Reverse	6 forward/6 reverse
Turning Radius	Not aval
Driver's Steering Controls	Hydrostatic double differential

### SUSPENSION

Type	Belleville Spring System suspended, dead track
Number Shock Absorbers per Side	NA
Road Wheels/Support Wheels per Side	6 road wheels/3 support wheels

### ARMAMENT

Primary Armament	105-mm, rifled main gun
Length of Tube	17.6 feet
Bore Evacuator/Muzzle Break	Yes/No
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	APDS--4,820 fps, HESH--2,400 fps, HE--1,990 fps, W8--1,990 fps
Maximum Sustained Rate of Fire	6 rounds/minute
Total Rounds Carried	52
Secondary Armament	Coaxially mounted 7.5-mm machinegun
Rate of Fire	500-1,000 rounds per minute
Rounds Carried	Not aval
Maximum Effective Range	Not aval



AA Armament	7.5-mm machinegun mounted on loader's cupola
Rate of Fire	500-1,000 rounds per minute
Rounds Carried	Not aval
Maximum Effective Range	Not aval
Smoke Projection/Number of Dischargers	6 smoke dischargers

#### FIRE CONTROL

Turret Power Control	Electrical-hydraulic and manual
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	360 degrees per 10 seconds
Gun Depression/Elevation	-10°/+21°
Commander's Override/Fire Control Override	Yes/Yes
Gun Stabilizer	Yes
Range Finder/Type	Yes/Coincidence
Magnification	8x
Range	400-4,000 meters
Range Setting Device	Drum
Elevation Quadrant	Yes/Clinometer
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Not aval
Gunner's Secondary Sight (Type/Magnification)	Not aval
Commander's Sight/Magnification	8x
Periscopes or Vision Blocks	Periscopes

#### NIGHT CAPABILITY

Searchlight/Type	No
Gunner's Night Sight/Magnification/Range	Not aval

Commander's Night Sight/Magnification/Range	Not aval
Commander's Searchlight	Not aval
IR Driving Light/Driver's Sight/Range	Not aval

#### NBC PROTECTION

Pressurization system

#### COMMUNICATIONS

The vehicle is commonly configured with two-set VHF installation.

Radio Model/AM/FM	Not aval
Band Width/Number Channels/Range	Not aval
External Phone	Yes
Intercom	Not aval
Other Equipment	Not aval

#### EXTRAS

Personnel Heater	Yes
Hull Escape Hatch	Yes
Drinking Water Capability	19-quart drinking water tank
Fire Fighting Equipment	Not aval
Fire Warning System	Not aval
Navigation Aids	Not aval
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	Not aval

#### SUMMARY

The power-to-weight ratio of the PZ61/68 enables it to negotiate the Swiss countryside for which it was intended. The firepower and mobility of this tank will enable it to fulfill a defensive role in difficult terrain for which it was designed.



Figure 6-1. Centurion MK 13. (Front view.)

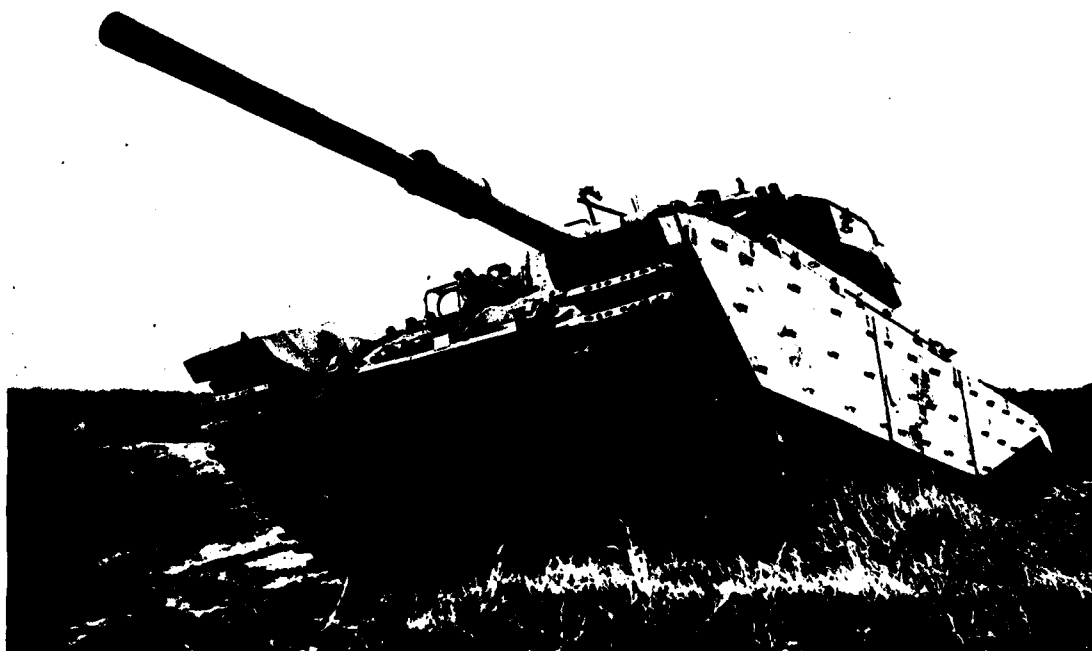


Figure 6-2. Centurion MK 13. (Bottom view.)

June 1973

### CENTURION MK 13 (Great Britain)

The Centurion was first designed in 1943 and produced in 1945, but was too late to see action in World War II. Since then the vehicle has been upgunned, uparmored, and improved through 13 models. This vehicle was for many years the British main battle tank until replaced by the Chieftain. The vehicle is currently in service with the following countries: Australia, India, Jordan, Denmark, Israel, Canada, Iraq, Kuwait, Lebanon, Netherlands, Switzerland, Sweden, and South Africa.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	57.4 tons
Unloaded Weight	55.2 tons
Power-to-Weight Ratio	12.7 bhp/ton
Ground Pressure (Combat Loaded)	13.3 psi
Length, Gun Forward	32.33 feet
Length of Hull Over Tracks	25.7 feet
Width	11.1 feet
Height to Topmost Point	9.75 feet
Height to Turret Roof	8.9 feet
Ground Clearance	1.6 feet
Width of Track	2 feet
Fuel Capacity	264 gallons

#### PERFORMANCE

Maximum Road Speed	35 mph
Road Range	150 miles
Maximum Gradient	60%
Maximum Tilt	17°
Maximum Step	3 feet
Maximum Trench	11 feet
Fording Depth	4.75 feet without prep, 9.75 feet with prep

### POWER TRAIN

Engine Type	12-cylinder V, gasoline
Engine hp	650 hp
Maximum Torque/rpm	1,550 ft-lbs/1,600 rpm
Type Cooling	Water
Second Engine	A 4-cylinder gasoline engine of 18 hp is used for main generator drive
Number Gears Forward and Reverse	5 forward/2 reverse
Turning Radius	15 feet in first gear, 130 feet in fifth gear
Driver's Steering Controls	Levers

### SUSPENSION

Type	Helical spring, suspended, dead track
No. of Shock Absorbers per Side	2 at first and sixth road wheels
Road Wheels/Support Wheels per Side	6 pairs road wheels/4 support rollers

### ARMAMENT

Primary Armament	105-mm rifled main gun
Length of Tube	17 feet
Bore Evacuator/Muzzle Brake	Yes/No
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	APDS--4,822 fps, HESH--2,227 fps SMOKE--Not avail CANISTER--Not avail
Maximum Sustained Rate of Fire	10 rounds first minute, 6 rounds per minute, thereafter
Total Rounds Carried/Rounds in Ready Rack	66/11
Secondary Armament	Cal .30 Browning machinegun mounted coaxially with main gun
Rate of Fire	650-750 rounds per minute
Rounds Carried	6,800
Maximum Effectiveness Range	1,500 meters

**AA Armament****Rate of Fire****Rounds carried****Maximum Effectiveness Range****Further Armament****Rate of Fire****Rounds Carried****Maximum Effectiveness Range****Smoke Projection/Number of Dischargers**

Cal .30 Browning machinegun mounted in commander's station

650-750 rounds per minute

Uses coax ammunition

1,500 meters

Ranging is done by a caliber .50 machinegun mounted coaxially with the main gun. It is fired in controlled three-round bursts

Three-round bursts

600

1,825 meters

Yes/12 dischargers (WP)

**FIRE CONTROL****Turret Power Control****By Commander/Gunner****Maximum Rate Power Traverse****Gun Depression/Elevation****Commander's Override/Fire Control Override****Gun Stabilizer/Vertical/Horizontal****Range Finder/Type****Range****Range Setting Device****Elevation Quadrant****Traverse (Azimuth) Indicator****Gunner's Sight (Type/Magnification)****Gunner's Secondary Sight (Type/Magnification)****Commander's Sight/Magnification****Periscopes or Vision Blocks**

Electrical or manual

Yes/Yes

360° in 26 seconds

-10°/+20°

Yes

Yes/Yes/Yes

Ranging machinegun

1,825 meters +

Graticules and drum

Yes

Yes

Periscope/6x

None

Periscope/10x

13 vision blocks

**NIGHT CAPABILITY****Searchlight/Type****Light Source/Planning Range****Gunner's Night Sight/Magnification/Range**

Yes/Dual purpose 1 kw

White: Not aval IR: Not aval

Not aval

Commander's Night Sight/Magnification/Range	Not aval
Commander's Searchlight	Spotlight on cupola
IR Driving Light/Driver's Sight/Range	2 IR headlights/Yes/Not aval

#### NBC PROTECTION

None

#### COMMUNICATIONS

The vehicle is commonly configured with the following communications system: One C42, range 15 miles, 36-40 MHz, 481 channels; one B47, range 5 miles, 38-54 MHz, 181 channels

External Phone	Yes
Intercom	Yes

#### EXTRAS

Personal Heaters	Yes
Hull Escape Hatch	Yes
Drinking Water Capability	10-gallon tank
Fire Fighting Equipment	Two CO2 bottles in driver's compartment connected to 5 spray nozzles in engine compartment
Fire Warning System	Flame detectors fitted in corner of main engine compartment, connected to warning horn in driver's compartment.
Navigation Aids	None
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	None

#### FAMILY OF VEHICLES

The several variations of this vehicle are:

Dozer tank	Engineer vehicle
Bridge layer	Flamethrower
Recovery vehicle	Artillery observation post
Duplex drive vehicle for amphibious landings	

### SUMMARY

This vehicle has been in service for 27 years and has seen action in Korea, the Indo/Pakistan, and Arab/Israeli wars. It has proved itself to be reliable and have excellent fire-power, the 105-mm gun being adopted by NATO as the standard tank gun.





Figure 7-1. Chieftain MK 5. (Front view.)



Figure 7-2. Chieftain MK 5. (Top view.)

June 1973

### CHIEFTAIN MK 5 (Great Britain)

The chieftain series tank was first introduced in 1963 and delivered to the British Army in 1967 as the replacement for the Centurion tank. The vehicle is also in service with Iran. The MK 5 vehicle is to be fitted with a laser range finder in the 1973 time frame.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	62 tons
Unloaded Weight	59-1/2-tons
Power-to-Weight Ratio	18.5 bhp/ton
Ground Pressure (Combat Loaded)	12.8 psi
Length, Gun Forward	35 feet
Length of Hull Over Tracks	24.6 feet
Width	11.5 feet
Height to Topmost Point	9.5 feet
Height to Turret Roof	8.6 feet
Ground Clearance	1.6 feet
Width of Track	2 feet
Fuel Capacity	252 gallons (234 gallons--MK 2)

#### PERFORMANCE

Maximum Road Speed	30 mph (governed)
Road Range	250-310 miles
Maximum Gradient	60%
Maximum Tilt	17°
Maximum Step	3 feet
Maximum Trench	10.3 feet
Fording	3.5 feet without prep; can cross submerged at 16 feet with snorkel with approximately 20 minutes for prep.

### POWER TRAIN

Engine Type	6-cylinder, vert-opposed tri-fuel engine, liquid cooled
Engine hp	720 bhp
Maximum Torque/rpm	1,620 ft-lbs/1,500 rpm
Type Cooling	Liquid cooled, capacity of 5 gallon
Second Engine	A 3-cylinder tri-fuel engine of 30 bhp for main generator drive and starting
Number Gears Forward and Reverse	6 forward/2 reverse
Turning Radius	Can pivot steer in neutral. 10 feet in first gear, 96.25 feet in sixth gear
Driver's Steering Controls	Levers

### SUSPENSION

Type	Helical spring, suspended, dead track.
Number Shock Absorbers per Side	One at front wheel station only
Road Wheels/Support Wheels per Side	6 pairs road wheels/3 support rollers

### ARMAMENT

Primary Armament	120-mm rifled main gun firing separate (bagged charge) ammunition
Length of Tube	21.7 feet
Bore Evacuator/Muzzle Brake	Yes/No
Thermal Tube Jacket	Yes
Type Ammunition/Muzzle Velocity	APDS--4,500 fps HESH and SMOKE 2,400 fps
Maximum Sustained Rate of Fire	8 rounds per first minute, 4 per minute thereafter
Total Rounds Carried/Rounds in Ready Rack	64 rounds carried, 18 in ready rack
Secondary Armament	7.62-mm machinegun mounted coaxially with main gun
Rate of Fire	650-750 rounds per minute

Rounds Carried	6,800
Maximum Effectiveness Range	1,500 meters
AA Armament	7.62-mm machinegun mounted in commander's station
Rate of Fire	650-750 rounds per minute
Rounds Carried	Same as coax
Maximum Effectiveness Range	1,500 meters
Further Armament	Ranging is done by caliber .50 machinegun mounted coaxially with main gun. It is fired in controlled three-round bursts
Rate of Fire	Three-round bursts
Rounds Carried	600
Maximum Effectiveness Range	1,825 meters
Smoke Projection/Number of Dischargers	Yes/12 dischargers

#### FIRE CONTROL

Turret Power Control	Electric or manual
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	360 degrees in 18 seconds
Gun Depression/Elevation	-10°/+20°
Commander's Override/Fire Control Override	Yes/Yes
Gun Stabilizer/Vertical/Horizontal	Fully stabilized, also traveling stabilization.
Range Finder/Type	Laser range finder. Now in limited service
Magnification	Not avail
Range	8,000 meters
Range Setting Device	Graticules and drum
Elevation Quadrant	Yes

Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Periscope/10x
Gunner's Secondary Sight (Type/Magnification)	Telescope/7x
Commander's Sight/Magnification	Binocular periscope/15x
Periscopes or Vision Blocks	11, including 2 spares

#### NIGHT CAPABILITY

Searchlight/Type	Yes/Dual purpose 2-kw xenon arc, under armor, adjustable by gunner
Light Source/Planning Range	White light--4,592 feet IR--3,280 feet
Gunner's Night Sight/Magnification/Range	Yes/3x binocular periscope/Not avail
Commander's Night Sight/Magnification/Range	Can be equipped with 3x binocular periscope
Commander's Searchlight	Dual purpose spotlight under armor mounted coaxially with AA machinegun
IR Driving Light/Driver's Sight/Range	Two 125-watt IR lights/Yes/range of 164 feet

#### NBC PROTECTION

Vehicle has complete protection when closed down, including pressurization.

#### COMMUNICATIONS

The vehicle is commonly configured with the following communications system: One C42 range 15 miles 36-40 MHz, 481 channels; one B47 range 5 miles, 38-54 MHz, 181 channels.

External Phone	Yes
Intercom	Yes

#### EXTRAS

Personnel Heaters	Heated suits for crewmen, no vehicle heater
Hull Escape Hatch	No
Drinking Water Capability	2 gallons, also boiling vessel
Fire Fighting Equipment	Two fixed BCF bottles in driver's compartment

**Fire Warning System**

A Graviner fire wire detector is fitted in engine and transmission compartments. Operates horn and flashing light

**Navigation Aids "Navaid"**

Gives six-digit grid coordinates

**Provisions made to Prevent Sight/Vision Obscuration from Mud, Water, etc.**

Sights and vision devices fitted with wipers and washers. Gunner and commander's sights are heated

**Trunnion Tilt Compensator**

Yes

**Auto IR Detection Device Warning System with Sound and Light**

**FAMILY OF VEHICLES**

An AVLB with 75-foot bridge, an armored recovery vehicle, and a bulldozer tank.

**SUMMARY**

The Chieftain has gone through 4 models, the first 3 being underpowered with a 650-hp engine. The MK 5, when fitted with the laser range finder, should prove to be the most effective gun armament system in existence, with a projected effective range of 8,000 meters.

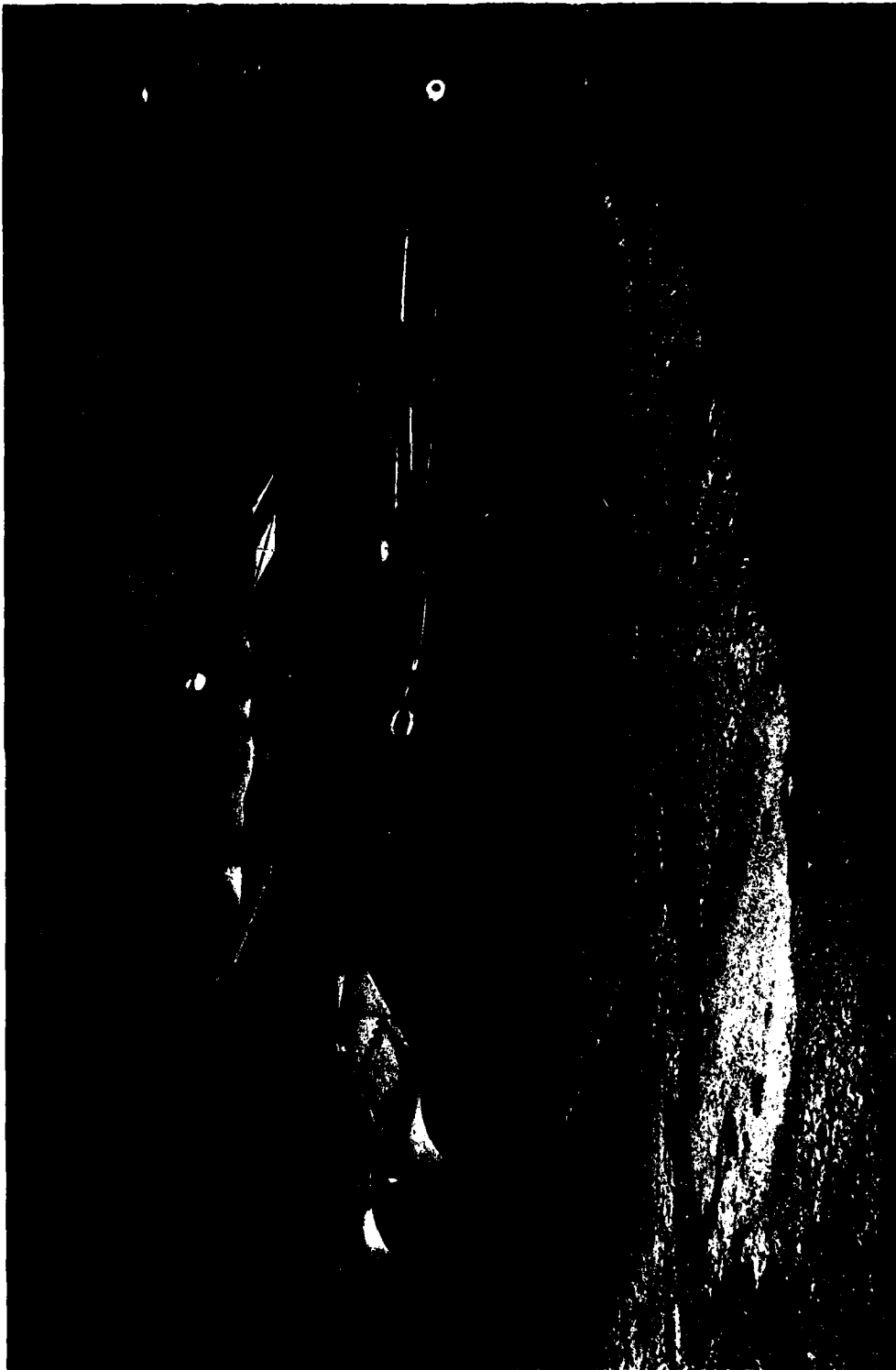


Figure 8-1. Vickers battle tank. (Side view.)

June 1973

## VICKERS BATTLE TANK (Great Britain/India)

The Vickers battle tank was introduced in 1963 by the Vickers Company of England for the Indian Army. The vehicle is produced in both England and India and is called "Vijayanta" (Freedom) by the Indians. This vehicle is also used by the government of Kuwait.

### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	42.5 tons
Unloaded Weight	39.8 tons
Power-to-Weight Ratio	17.8 bhp/ton
Ground Pressure (Combat Loaded)	12.35 psi
Length, Gun Forward	32.2 feet
Length of Hull Over Tracks	24.8 feet
Width	10.4 feet
Height to Topmost Point	8.9 feet
Height to Turret Roof	8.2 feet
Ground Clearance	1.33 feet
Width of Track	1.7 feet
Fuel Capacity	26.4 gallons

### PERFORMANCE

Maximum Road Speed	33 mph
Road Range	375 miles
Maximum Gradient	60%
Maximum Tilt	17°
Maximum Step	3 feet
Maximum Trench	8 feet
Fording Depth	3.75 feet without prep, 7.25 feet with prep. Can swim with screen



### POWER TRAIN

Engine Type	6-cylinder, vertical-opposed tri-fuel, liquid cooled
Engine hp	650 hp
Maximum Torque/rpm	1,240 ft-lbs/1,250 rpm
Type Cooling	5-gallon, liquid cooled
Second Engine	A 3-cylinder, tri-fuel engine of 30 bhp used for main generator drive and starting
Number Gears Forward and Reverse	6 forward/2 reverse
Turning Radius	6.7 feet in first gear, 95 feet in sixth gear
Driver's Steering Controls	Levers

### SUSPENSION

Type	Torsion bar, suspended, dead track
Number Shock Absorbers per Side	3/on first, second, and sixth road wheels
Road Wheels/Support Wheels per Side	6 pairs/3 support rollers

### ARMAMENT

Primary Armament	105-mm rifled main gun
Length of Tube	17 feet
Bore Evacuator/Muzzle Brake	Yes/No muzzle brake
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	APDS--4, 822 fps HESH 2, 227 fps SMOKE--Not aval CANISTER--Not aval
Maximum Sustained Rate of Fire	10 rounds first minute, 6 rounds/minute sustained
Total Rounds Carried/Rounds in Ready Rack	50/20
Secondary Armament	7.62-mm machinegun mounted coaxially with main gun

Rate of Fire	650-750 rounds per minute
Rounds Carried	6,800
Maximum Effective Range	1,500 meters
AA Armament	7.62-mm machinegun mounted in commander's station
Rate of Fire	650-750 rounds per minute
Rounds Carried	Uses coax ammunition
Maximum Effective Range	1,500 meters
Further Armament	Ranging is done by a caliber .50 machinegun mounted coaxially with the main gun. It is fired in controlled three-round burst
Rate of Fire	Three-round bursts
Rounds Carried	600
Maximum Effective Range	1,825 meters
Smoke Projection/Number of Discharges	Yes/12 dischargers

#### FIRE CONTROL

Turret Power Control	Electrical or manual
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	360° in 12.8 seconds
Gun Depression/Elevation	-10°/+20°
Commander's Override/Fire Control Override	Yes/No
Gun Stabilizer/Vertical/Horizontal	Yes/Yes/Yes
Range Finder/Type	Ranging machinegun
Range	1,825 meter plus
Range Setting Device	Graticules and drum
Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Periscope/8x

Gunner's Secondary Sight (Type/Magnification)	None
Commander's Sight/Magnification	Periscope/10x
Periscopes or Vision Blocks	9

#### NIGHT CAPABILITY

Searchlight/Type	Optional
Light Source/Planning Range	White and IR/Not avail
Gunner's Night Sight/Magnification/Range	Can be supplied
Commander's Night Sight/Magnification/Range	None
Commander's Searchlight	Optional spotlight
IR Driving Light/Driver's Sight/Range	Two IR's/Yes/50 meters

#### NBC PROTECTION

Vehicle has complete protection when closed down, including pressurization.

#### COMMUNICATIONS

The vehicle is commonly configured with the following communications system: One British C42, range 15 miles, 36-40 MHz, 481 channels; 1 British B47, range 5 miles, 38-54 MHz, 181 channels.

External Phone	Yes
Intercom	Yes

#### EXTRAS

Personnel Heater	None
Hull Escape Hatch	None
Drinking Water Capability	None
Fire Fighting Equipment	Two BCF's in driver's compartment
Fire Warning System	Four flame detectors in engine compartment, operating an electric horn in driver's compartment
Navigation Aids	None
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	None

### SUMMARY

This commercially designed vehicle rates firepower as the prime requirement and utilizes the same gun as the Centurion. It also uses the same transmission and engine as that of the Chieftain MK 5. The MK 2 Vickers, which had minor design changes, is the type utilized by Kuwait. The MK 2, which was not produced, featured four turret-mounted Swing-fire AT missiles. The MK 3 is the latest version.



Figure 9-1. M48A3 Tank. (Front view.)

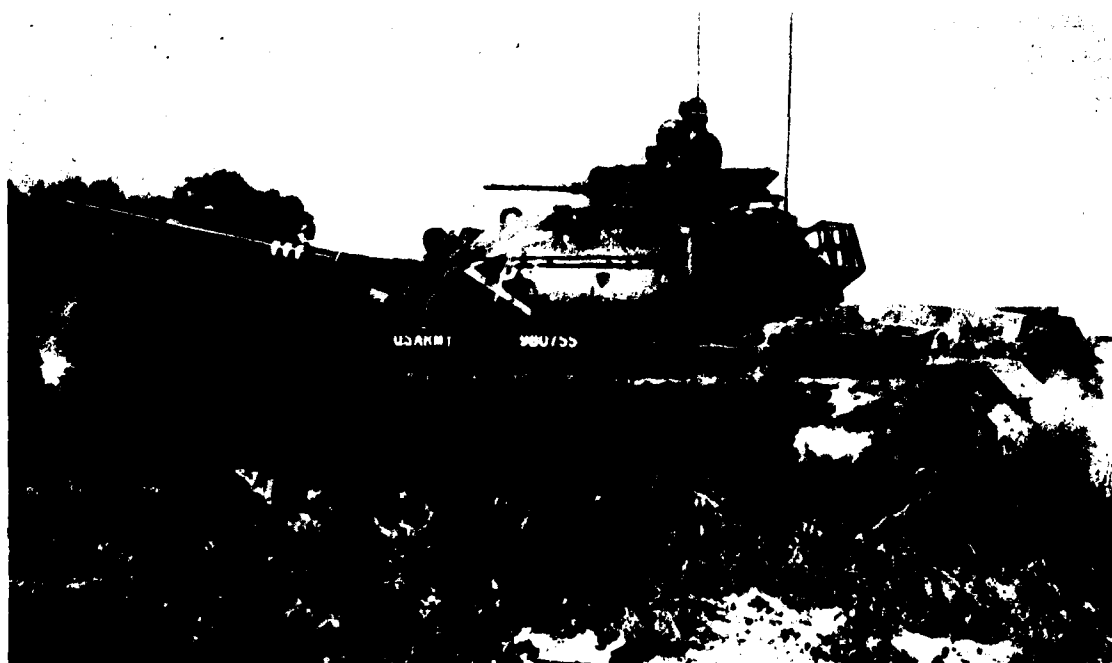


Figure 9-2. M48A3 Tank. (Side view.)

June 1973

### M48A3 (United States)

The M48 series was first introduced in 1952 by the US Army. The M48A3 was introduced in 1964 as a refinement to the M48A2.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	52 tons
Unloaded Weight	49 tons
Power-to-Weight Ratio	14.4
Ground Pressure (Combat Loaded)	11.8 psi
Length, Gun Forward	28.5 feet
Length of Hull Over Tracks	22.6 feet
Width	11.9 feet
Height to Topmost Point	10.2 feet
Height to Turret Roof	9.3 feet
Ground Clearance	1.4 feet
Width of Track	2.3 feet
Fuel Capacity	375 gallons

#### PERFORMANCE

Maximum Road Speed	30 mph
Road Range	310 miles
Maximum Gradient	60%
Maximum Tilt	30°
Maximum Step	3 feet
Maximum Trench	8.5 feet
Fording Depth	48 inches (4 feet) without prep, 8 feet with prep, 13.5 feet with kit

### POWER TRAIN

Engine Type	V12 diesel
Engine hp	750 at 2,400 rpm
Maximum Torque/rpm	1,720 lbs-ft at 1,800 rpm
Type Cooling	Air-cooled
Second Engine	None
Number Gears Forward and Reverse	2 forward, 1 reverse (automatic)
Turning Radius	Pivot to infinity
Driver's Steering Controls	Mechanical steering control; mechanical linked brake foot pedal; transmission shift range--neutral, park, low, high, reverse

### SUSPENSION

Type	Torsion bar, suspended, live track
Number Shock Absorbers per Side	3/1, 2, 6 road wheels
Road Wheels/Support Wheels per Side	6 pairs/3 support rollers

### ARMAMENT

Primary Armament	Main gun, 90-mm, rifled
Length of Tube	17.3 feet
Bore Evacuator/Muzzle Brake	Yes/Yes
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	AP--2,800 fps HE--2,400 fps HEP--2,700 fps Canister HVAP--3,825 fps HEAT--2,800 fps
Maximum Sustained Rate of Fire	6-7 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	62/16
Secondary Armament	Machinegun 7.62-mm, coax mounted with main gun

Rate of Fire	500-600 rpm
Rounds Carried	6,000
Maximum Effective Range	900 meters
AA Armament	Machinegun caliber .50 at commander's station
Rate of Fire	450-500 rpm
Rounds Carried	600
Maximum Effective Range	1,600 meters
Further Armament	None
Smoke Projection/Number of Dischargers	None

#### FIRE CONTROL

Turret Power Control	Electro-hydraulic and/or manual
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	15 secs for 360°
Gun Depression/Elevation	-8.4°/+19°
Commander's Override/Fire Control Override	Yes/Yes
Gun Stabilizer/Vertical/Horizontal	No
Range Finder/Type	Yes/Coincidence
Magnification	10x
Range	480 to 4,400 meters
Range Setting Device	Coupled ballistic computer
Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Periscope/8x
Gunner's Secondary Sight (Type/Magnification)	Telescope/8x
Commander's Sight/Magnification	Range finder
Periscopes or Vision Blocks	Driver's IR periscope, driver 3 vision blocks, commander 5 vision blocks



### NIGHT CAPABILITY

Searchlight/Type	Yes/xenon
Light Source/Planning Range	IR and white/2,000 meters
Gunner's Night Sight/Magnification/Range	Periscope/8x
Commander's Night Sight/Magnification/Range	IR binoculars
Commander's Searchlight	None
IR Driving Light/Driver's Sight/Range	Yes/Periscope/50 meters

### NBC PROTECTION

Gas Particulate Filler

### COMMUNICATIONS

The vehicle is commonly configured with the following US communications systems  
AN/VRC-12, -46, -47, -64.

Radio Model/AM/FM	FM
Band Width/Number Channels/Range AN/VRC-12, -46, -47, (-64)	30.00-75.95 MHz/920/15(5) miles
External Phone	Yes
Intercom	Yes

### EXTRAS

Personnel Heaters	Yes
Hull Escape Hatch	Yes/In driver's compartment
Drinking Water Capability	None
Fire Warning System	None
Fire Fighting Equipment	Engine compartment three, 10-1b, CO <sub>2</sub> extinguisher Crew compartment two, 5-1b, CO <sub>2</sub> extinguisher
Navigation Aids	None
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	None

### FAMILY OF VEHICLES

M48 series vehicles include M67 flamethrower tank, armored vehicle launched bridge, and bulldozer tank.

### SUMMARY

The M48A3 was last utilized by regular US forces in Vietnam and is still in service with some US Reserve units. This series tank can be found in many other countries.



Figure 10-1. M60A1 tank. (Front view.)



Figure 10-2. M60A1 tank. (In action.)

June 1973

### M60A1 (United States)

The M60 series tank was first introduced in 1961 by the US Army. The M60A1 was introduced in 1962 as a refinement to the M60.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	53 tons
Unloaded Weight	48.5 tons
Power-to-Weight Ratio	14.1
Ground Pressure (Combat Loaded)	11.1 psi
Length, Gun Forward	30.9 feet
Length of Hull Over Tracks	22.8 feet
Width	11.9 feet
Height to Topmost Point	10.8 feet
Height to Turret Roof	9.8 feet
Ground Clearance	1.5 feet
Width of Track	2.3 feet
Fuel Capacity	375 gallons

#### PERFORMANCE

Maximum Road Speed	30 mph
Road Range	310 miles
Maximum Gradient	60%
Maximum Tilt	30°
Maximum Step	3 feet
Maximum Trench	8.5 feet
Fording Depth	4 feet without prep, 13.5 with kit 8 feet with prep

### POWER TRAIN

Engine Type	V12 diesel
Engine hp	750 hp
Maximum Torque/rpm	1,720 lbs-ft at 1,800 rpm
Type Cooling	Air-cooled
Second Engine	None
Number Gears Forward and Reverse	2 forward, 1 reverse (automatic)
Turning Radius	Pivot to infinity
Driver's Steering Controls	T bar pivot mounted; mech control, brake foot pedal; transmission shift range--neutral, park, low, high, reverse

### SUSPENSION

Type	Torsion bar, suspended, live track
Number Shock Absorbers per Side	3/1, 2, 6, road wheels
Road Wheels/Support Wheels per Side	6 pairs/3 support rollers

### ARMAMENT

Primary Armament	Main gun, 105-mm, rifled
Length of Tube	18.1 feet
Bore Evacuator/Muzzle Brake	Yes/No
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	APDS--4,820 fps HEAT--3,840 fps HEP--2,600 fps
Maximum Sustained Rate of Fire	6 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	63/13
Secondary Armament	7.62-mm coax mounted
Rate of Fire	450-500 rpm
Rounds Carried	5,950 loaded
Maximum Effective Range	900 meters

<b>AA Armament</b>	Cal . 50, TC cupola
<b>Rate of Fire</b>	High 800-950 rpm, low 400-500 rpm
<b>Rounds Carried</b>	900
<b>Maximum Effective Range</b>	1,600 meters
<b>Further Armament (if applicable)</b>	None
<b>Smoke Projection/Number of Dischargers</b>	None

#### FIRE CONTROL

<b>Turret Power Control</b>	Electro-hydraulic and/or manual
<b>By Commander/Gunner</b>	Yes/Yes
<b>Maximum Rate Power Traverse</b>	15 secs for 360°
<b>Gun Depression/Elevation</b>	-10°/+20°
<b>Commander's Override/Fire Control Override</b>	Yes/Yes
<b>Gun Stabilizer/Vertical/Horizontal</b>	Not at present
<b>Range Finder Type</b>	Coincidence (laser range finder under development)
<b>Magnification</b>	10x
<b>Range</b>	500-4,400 meters
<b>Range Setting Device</b>	Cupoled ballistic computer
<b>Elevation Quadrant</b>	Yes
<b>Traverse (Azimuth) Indicator</b>	Yes
<b>Gunner's Sight (Type/Magnification)</b>	Periscope
<b>Gunner's Secondary Sight (Type/Magnification)</b>	Telescope/8x
<b>Commander's Sight/Magnification</b>	Periscope/8x
<b>Periscopes or Vision Blocks</b>	Commander--8 Gunner--1 Loader--1 Driver--3

### NIGHT CAPABILITY

Searchlight/Type	Yes/xenon
Light Source/Planning Range	IR and white/2,000 meters
Gunner's Night Sight/Magnification/Range	Periscope, 8x
Commander's Night Sight/Magnification/Range	Periscope, 7x
Commander's Searchlight	None
IR Driving Light/Driver's Sight/Range	Yes/periscope/50 meters

### NBC PROTECTION

Gas particulate

### COMMUNICATIONS

The vehicle is commonly configured with the following US communication systems:  
AN/VRC-12, -46, -47, -64.

Radio Model/AM/FM	FM
Band Width/Number Channels/Range AN/VRC-12, -46, -47, (-64)	30.00-75.95 MHz/920/15(5) miles
External Phone	Yes
Intercom	Yes

### EXTRAS

Personnel Heaters	Yes
Hull Escape Hatch	Yes, driver's compartment
Drinking Water Capability	None
Fire Warning System	None
Fire Fighting Equipment	Engine Compartment two 10-lb CO <sub>2</sub> extinguishers Crew Compartment two 5-lb CO <sub>2</sub> extinguishers
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	None

### FAMILY OF VEHICLES

Bridge tank

### SUMMARY

Proposed product improvement of the M60A1 will add a laser range finder, main gun stabilization, and thermal tube jacket without major component modification to the existing M60A1's. These modifications will be applied during product improvement of M60A1's in the present inventory.





Figure 11-1. M60A2 tank. (Top view.)

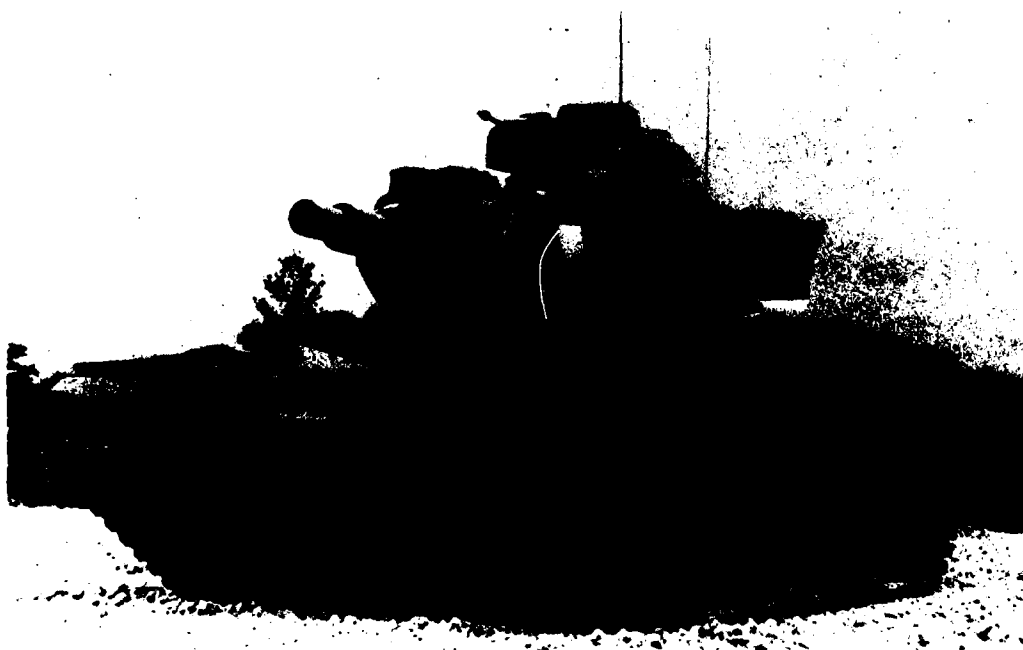


Figure 11-2. M60A2 tank. (Front view.)

June 1973

### M60A2 (United States)

The M60 series was first introduced in 1961 by the US Army. The M60A2 was introduced in 1971 as an augmentation to the M60A1.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	57.3 tons
Unloaded Weight	45.7 tons
Power-to-Weight Ratio	13.8
Ground Pressure (Combat Loaded)	12.3 psi
Length, Gun Forward	23.9 feet
Length of Hull Over Tracks	22.8 feet
Width	11.9 feet
Height to Topmost Point	10.9 feet
Height to Turret Roof	9.8 feet
Ground Clearance	1.5 feet
Width of Track	2.3 feet
Fuel Capacity	385 gallons

#### PERFORMANCE

Maximum Road Speed	30 mph
Road Range	280 miles
Maximum Gradient	60%
Maximum Tilt	30
Maximum Step	3 feet
Maximum Trench	8.5 feet
Fording Depth	8 feet with prep, 4 feet without prep, 13.5 feet with kit, kit application time 60 minutes

Engine Type	V12 diesel
Engine hp	750 hp
Maximum Torque/rpm	1,720 lbs-ft at 1,800 rpm
Type Cooling	Air-cooled
Second Engine	None
Number Gears Forward and Reverse	2 forward, 1 reverse (automatic)
Turning Radius	Pivot to infinity
Driver's Steering Controls	T bar mounted; mech steering control; mech linked brake foot pedal, transmis- sion shift range neutral, low, high, reverse

#### SUSPENSION

Type	Torsion bar, suspended, live track
Number Shock Absorbers per Side	3/1, 2, 6 road wheels
Road Wheels/Support Wheels per Side	6 pairs/3 support rollers

#### ARMAMENT

Primary Armament	Main gun, 152-mm, rifled
Length of Tube	9.6 feet
Bore Evacuator/Muzzle Brake	Yes/No
Thermal Tube Jacket	No
Type Ammunition/Muzzle Velocity	Missile HEAT--2,240 fps Canister--2,240 fps
Maximum Sustained Rate of Fire	4 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	46/15 conventional, 7 missile
Secondary Armament	Coax mounted 7.62-mm
Rate of Fire	450-500 rpm
Rounds Carried	5,500
Maximum Effectiveness Range	900 meters

AA Armament	Cal .50, TC cupola
Rate of Fire	High 800-950 rpm, low 400-500 rpm
Rounds Carried	1,080
Maximum Effective Range	1,600 meters
Further Armament (if applicable)	None
Smoke Projection/Number of Dischargers	Yes/8

#### FIRE CONTROL

Turret Power Control	Electro-hydraulic and/or manual
By Commander/Gunner	Yes/Yes
Maximum Rate Power Traverse	9.1 secs for 360°
Gun Depression/Elevation	-10°/+20°
Commander's Override/Fire Control Override	Yes/Yes
Gun Stabilizer/Vertical/Horizontal	Yes/Yes/Yes
Range Finder/Type	Yes/laser
Magnification	NA
Range	Classified
Range Setting Device	Coupled ballistic computer
Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Periscope/8x
Gunner's Secondary Sight (Type/Magnification)	Telescope/8x (primary sight for missile)
Commander's Sight/Magnification	Periscope/8x
Periscopes or Vision Blocks	Driver--3, plus driving periscope Loader--1 periscope TC--10 vision blocks

#### NIGHT CAPABILITY

Searchlight/Type	Yes/AN/VSS2
Light Source/Planning Range	IR and white/1,500 meters

Gunner's Night Sight/Magnification/Range	Periscope/10x
Commander's Night Sight/Magnification/Range	Periscope/10x
Commander's Searchlight	None
IR Driving Light/Driver's Sight/Range	Yes/periscope/50 meters

#### NBC PROTECTION

Gas particulate

#### COMMUNICATIONS

The vehicle is commonly configured with the following US communication systems:  
AN/VRC-12, -47, -46, -64.

Radio Model/AM/FM	FM
Band Width/Number Channels/Range	30.00-75.95 MHz/920/15(5) miles
AN/VRC-12, -46, -47, (-64)	

External Phone	Yes
Intercom	Yes

#### EXTRAS

Personnel Heaters	Yes
Hull Escape Hatch	Yes/in driver's compartment
Drinking Water Capability	None
Fire Warning Equipment	None
Fire Fighting Equipment	Engine compartment, three 10-lb CO <sub>2</sub> extinguishers, crew compartment, one 5-lb CO <sub>2</sub> extinguisher
Navigation Aids	None

#### FAMILY OF VEHICLES

Part of the M60 family of tanks.

#### SUMMARY

The M60A2 tank has a long range, highly accurate engagement capability with its combination laser range finder and missile system. The vehicle was designed to augment the current M60 series main battle tank. Standard production was begun in 1973.



Figure 12-1. M60A3 tank.

### M60A3 (United States)

The M60A3 tank is an improved M60A1 tank with most of the characteristics of the M60A1. The product improvement consists of the following items:

1. Main gun system fully stabilized.
2. Tube-over-bar suspension system for increased cross-country speeds up to 20 mph.
3. Laser range finder with range from 200 to 5,000 meters  $\pm$  10 meters.
4. Solid state XM21 computer.
5. AVDS-1790-2A Reliability Improved Selected Equipment (RISE) engine, 750 bhp diesel. The least reliable parts in the engine have been replaced with parts that will last longer and require less service.
6. Top loading, 900 cubic feet per minute air filters.
7. Product improved T-142 track. This steel track will have a longer road life, and its rubber pads can be removed to increase traction on ice.

### SUMMARY

The M60A3 is intended to extend the usefulness of the M60 series tank family into the 1980's. The tank is currently undergoing equipment tests and should be fielded in the 1976 time frame.

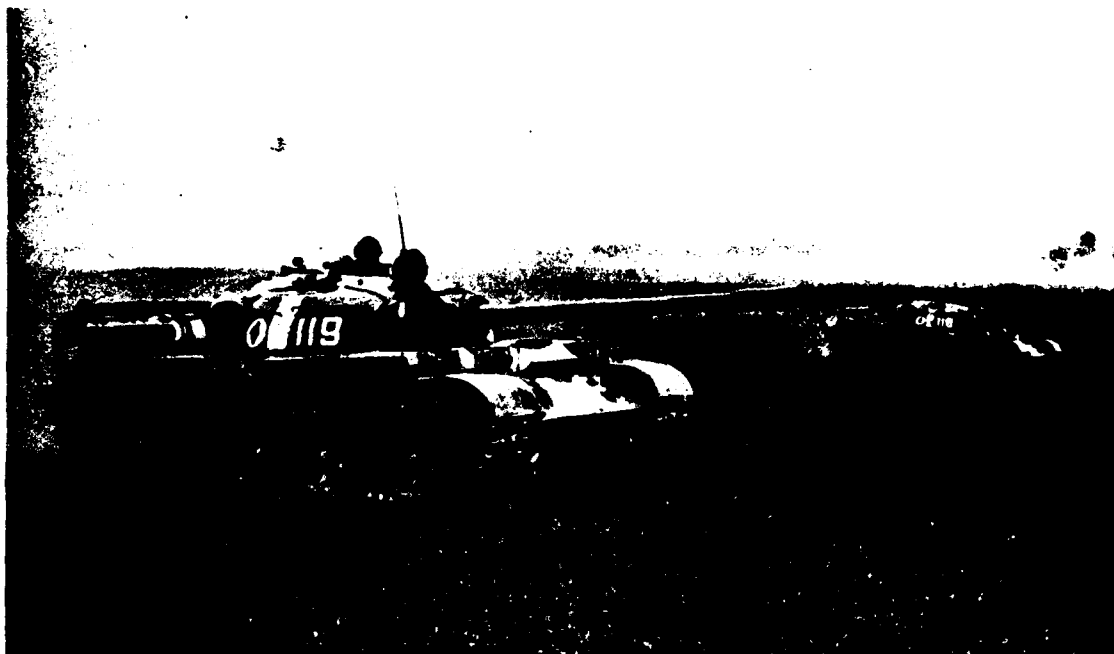


Figure 13-1. T54/55. (Side view.)



Figure 13-2. T54/55 in winter operations.

June 1973



### T54/55 (Soviet Union)

The T54 went into service sometimes between 1947 and 1949 as a replacement for the T34. It has provided the basis for subsequent Soviet tank development and design. The tank was produced in great numbers and can be found in the armies of all communist bloc countries and those nonaligned countries accepting Soviet military aid.

The T54 was continually product improved after its introduction. When sufficient changes were made, the tank was given a new model number T55, and was shown publicly in 1961. The T55, along with the Communist Chinese copy, the T49, is presently the main battle tank of the communist bloc countries.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	40 tons
Ground Pressure (Combat Loaded)	11.8 psi
Length, Gun Forward	29.5 feet
Length of Hull Over Tracks	21.17 feet
Width	10.75 feet
Height to Topmost Point	7.09/7.7 feet
Height to Turret Roof	7.92 feet
Ground Clearance	1.42 feet
Width of Track	1.90 feet

#### SUSPENSION

Type	Torsion bar, flat dead track
Number Shock Absorbers per Side	2, on first and fifth road wheels
Road Wheels/Support Wheels per Side	5 pairs/None

#### ARMAMENT

Primary Armament	100-mm rifled main gun
Length of Tube	18.4 feet
Bore Evacuator/Muzzle Brake	First T54's did not have a bore evacuator. All later model T54's and all T55's have bore evacuators. Neither has a muzzle brake.

Thermal Tube Jacket	None
Type Ammunition/Muzzle Velocity	APHE--3,280 fps HE--Not aval HVAP--Not aval APDS (?)/Not aval
Maximum Sustained Rate of Fire	Approx 3-5 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	T54--34, T55--43
Secondary Armament	7.62-mm coax mounted on right side of main gun
Rate of Fire	600-700 rounds per minute
Rounds Carried	3,000
Maximum Effective Range	1,000 meters
AA Armament	12.7-mm machinegun mounted at the loader's hatch
Rate of Fire	540-600 rounds per minute
Rounds Carried	500
Maximum Effective Range	2,000 meters
Further Armament	7.62-mm bow machinegun on T54 and T55M-1; none of the later models of the T55 have a bow gun
Smoke Projection/Number of Dischargers	Smoke screen generated by vaporized fuel injected in the exhaust
Fuel Capacity	215/? gallons integral and 321/360 gallons with auxiliary fuel tanks
Power-to-Weight Ratio	13/14.5:1

#### PERFORMANCE

Maximum Road Speed	31 mph
Road Range	Approx 250/310 miles on integral fuel tanks, and 375/445 with auxiliary fuel tanks
Maximum Gradient	60%
Maximum Tilt	Not aval
Maximum Step	2.58 feet

Maximum Trench	8.90 feet
Fording Depth	13-18 feet because of the various snorkel lengths available 4.25 feet without preparation

#### POWER TRAIN

Engine Type	V12 diesel
Engine hp	T54--520 hp, T55--580 hp
Maximum Torque/rpm	Not aval
Type Cooling	Liquid
Second Engine	None
Number Gears Forward and Reverse	5 forward/1 reverse
Turning Radius	26.3 feet
Driver's Steering Controls	Not aval

#### FIRE CONTROL

Turret Power Control	Electro-hydraulic
By Commander/Gunner	Yes/Yes
Maximum Rate of Power Traverse	360° in 21 seconds
Gun Depression/Elevation	-4°/+17°
Commander's Override/Fire Control Override	Horizontal only/Not aval
Gun Stabilizer/Vertical/Horizontal	Early models of the T54 were stabilized in the vertical plane only. Subsequent T54's and T55's are stabilized in both planes.
Range Finder/Type	Stadiametric (range graticules). Similar in function to the sight on the M551, only the reticle is based on the height rather than the length of the target.
Magnification	Not aval
Range	Not aval
Range Setting Device	Not aval

Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Not aval/3.5x and 7x
Gunner's Secondary Sight (Type/Magnification)	None
Commander's Sight/Magnification	None except range finding sight
Periscopes or Vision Blocks	Commander--4, driver--2

#### NIGHT CAPABILITY

Searchlight/Type	T54B and all subsequent models have an IR searchlight
Light Source/Planning Range	IR, approximately 1,000 meters
Gunner's Night Sight/Magnification/Range	Not aval
Commander's Night Sight/Magnification/Range	Not aval
Commander's Searchlight	Commencing with the T54B, the commanders have an IR searchlight
IR Driving Light/Driver's Sight/Range	1/Yes/40 meters

#### NBC PROTECTION

Exact details are unavailable.

#### COMMUNICATIONS

The vehicle is commonly configured with the following communications system: Not aval

Radio Model/AM/FM

Band Width/Number Channels/Range

External Phone

Intercom

#### EXTRAS

Heaters	Not aval
Hull Escape Hatch	Yes
Drinking Water Capability	Not aval

Fire Fighting Equipment	Automatic fire extinguishers
Fire Warning System	Not aval
Navigation Aids	Not aval
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	Not aval

#### FAMILY VEHICLES

The following vehicles are part of the family of vehicles built around the T54/55 chassis:

Mine Clearing Tank

Bulldozer Tank

Bridge layer tank with 2 bridges available, 40 feet 4 inches, and 65 feet long. The bridge is winched into position.

Trench digger tank reportedly can dig a trench 36 feet long and 2 feet deep in 1 minute.

Recovery Tank.

#### SUMMARY

The T54/55 is a fairly simple, reliable tank that meets the requirements of the Soviet Army. It has a vary low silhouette, and good cross-country mobility, *including the ability* to conduct deepwater fording with a minimum of preparation time. The low silhouette and the resultant small size of the fighting compartment provide cramped space for the crew as well as reducing the number of main gun rounds that can be carried. The early model T54's main guns were stabilized in the vertical plane only; all subsequent tanks starting with the T54B has a main gun stabilized in both the vertical and horizontal planes. Neither tank has a ballistic computer. Ranging is accomplished by the tank commander utilizing a sight that is similar in function to that found in the M551 General Sheridan or the 90-mm recoilless rifle.



Figure 14-1. T62 tank. (Top view.)



Figure 14-2. T62. (Rear view.)

June 1973

### T62 (Soviet Union)

The T62, currently the main battle tank of the Soviet Union, was shown publicly in 1965; although it is believed to have been in service since 1962. In appearance it is very similar to the T54 and T55 from which it was developed.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	40.2 tons
Power-to-Weight Ratio	15.5:1
Ground Pressure (Combat Loaded)	Approx 10.2 psi
Length, Gun Forward	32 feet
Length of Hull Over Tracks	22.50 feet
Width	10.83 feet
Height to Topmost Point	7.83 feet
Height to Turret Roof	7.83 feet
Ground Clearance	1.40 feet
Width of Track	1.67 feet
Fuel Capacity	254 gallons in integral fuel tanks, and 360 gallons with auxiliary fuel tanks

#### PERFORMANCE

Maximum Road Speed	30 mph
Road Range	Approximately 310 miles on integral fuel tanks, and 445 miles using auxiliary fuel tanks
Maximum Gradient	60%
Maximum Tilt	Not aval
Maximum Step	2.6 feet
Maximum Trench	9.17 feet
Fording Depth	With preparation 13-18 feet because of the various snorkel lengths available, without preparation fording depth is 4.50 feet. Preparation time for deep fording is unavailable

#### POWER TRAIN

Engine Type	V12 diesel
Engine hp	580 hp
Maximum Torque/rpm	Not aval
Type Cooling	Liquid
Second Engine	None
Number Gears Forward and Reverse	5 forward/1 reverse
Turning Radius	28.8 feet
Driver's Steering Controls	Not aval

#### SUSPENSION

Type	Torsion bar, flat, dead track
Number Shock Absorbers per Side	2/on first and fifth road wheels
Road Wheels/Support Wheels per Side	5 pairs/None

#### ARMAMENT

Primary Armament	115-mm smooth bore main gun
Length of Tube	Approximately 23 feet
Bore Evacuator/Muzzle Brake	Yes, midway down the tube/No
Thermal Tube Jacket	None
Type Ammunition/Muzzle Velocity	APDS/approx 4,900 fps, fin stabilized HEAT--Not aval
Maximum Sustained Rate of Fire	Approximately 3-4 rounds per minute
Total Rounds Carried/Rounds in Ready Rack	44/Not aval
Secondary Armament	7.62-mm coax mounted on right side of the main gun
Rate of Fire	600-700 rounds per minute
Rounds Carried	2,200
Maximum Effective Range	1,000 meters



AA Armament	None (12.7-mm mg being retrofitted)
Further Armament	None
Smoke Projection/Number of Dischargers	Smoke screen generated by vaporized fuel injected into the exhaust

#### FIRE CONTROL

Turret Power Control	Electro-hydraulic
By Commander/Gunner	Yes/Yes
Maximum Rate of Power Traverse	Not aval
Commander's Override/Fire Control Override	Yes/Not aval
Gun Depression/Elevation	-4°/+17°
Gun Stabilized/Vertical/Horizontal	Yes/Yes/Yes
Range Finder/Type	Stadiametric (range graticules). Similar in function to the sight on the M551, only the reticle is based on the height rather than the length of the target. May have laser range finder.
Magnification	Not aval
Range	Not aval
Range Setting Device	Not aval
Elevation Quadrant	Yes
Traverse (Azimuth) Indicator	Yes
Gunner's Sight (Type/Magnification)	Not aval
Gunner's Secondary Sight	Not aval
Commander's Sight/Magnification	None except range finding sight
Periscopes of Vision Blocks	Commander--5, loader--1, gunner--1, driver--2

#### NIGHT CAPABILITY

Searchlight/Type	Yes/Probably same as on T54/55
Light Source/Planning Range	Probably IR/approximately 1,000 meters

Gunner's Night Sight	Not aval
Commander's Night Sight	Not aval
Commander's Searchlight	Yes
IR Driving Light/Driver's Sight/Range	1/Yes/40 meters

#### NBC PROTECTION

The vehicle has protection but the exact details are unavailable.

#### COMMUNICATIONS

Information is unavailable as to the exact systems and radios used in the vehicle; however, it is sufficiently sophisticated to allow for coordination with artillery and air units. There is speculation that the sophisticated radios are found only at higher levels of command.

#### EXTRAS

Personnel Heater	Not aval
Hull Escape Hatch	Not aval
Drinking Water Capability	Not aval
Fire Fighting Equipment	Probably has automatic fire extinguisher system similar to the T55
Fire Warning System	Not aval
Navigation Aids	Not aval
Provisions made to prevent Sigt/Vision Obscuration from Mud, Water, etc.	Not aval

#### FAMILY OF VEHICLES

There is presently no information available as to whether or not a family of vehicles is built around this vehicle.

#### SUMMARY

The most notable feature of the T62 is the 115-mm, smooth bore gun. The fire control system is believed to be essentially the same as that found on the T55 with the possible exception that it may be fitted with a laser range finder. There are several distinguishing characteristics that aid in distinguishing the T62 from the T54/55. The T62 has the bore evacuator in the middle of the tube while the T54/55 either does not have one or it is located on the end of the gun tube. The four infantry bars on the T62 turret all bow up and while the bars on the T54/55 have 2 that are straight and 2 that bow upward. The fighting compartment is quite small by US standards. The Soviet tank is designed to accommodate the 5 percentile man or a man who is no taller than 5 feet 4 inches. Since the Soviets restrict the size of their tank crewmen, the cramping is not quite as critical as it would be to the US tanker.

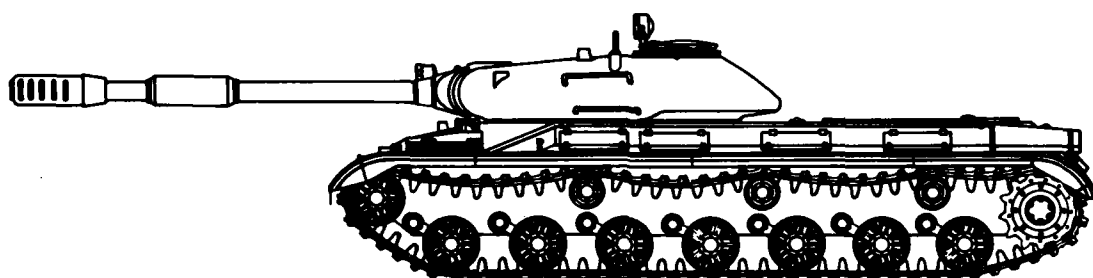


Figure 15-1. Drawing of T10M tank.



Figure 15-2. T10M tank. (Front view.)

June 1973

### T10M (Soviet Union)

This heavy tank is derived from the T10, and the latest version of the Joseph Stalin (JS) family. It is deployed principally in the USSR, but is also known to be funneled into East Germany.

#### DIMENSIONAL STATISTICS

Crew	4
Combat Weight	55.1 tons
Unloaded Weight	Not avail
Power to Weight	13 bhp/ton
Ground Pressure (Combat Loaded)	10.1 psi
Length, Gun Forward	35 feet
Length of Hull Over Tracks	23.1 feet
Width	11.25 feet
Height to Topmost Point	7.9 feet
Height to Turret Roof	7.7 feet
Ground Clearance	1.5 feet
Width of Track	2.36 feet
Fuel Capacity	305 gallons (US)

#### PERFORMANCE

Maximum Road Speed	31 mph
Road Range (without aux/With aux tanks)	155 miles/261 miles
Maximum Gradient	62.5%
Maximum Tilt	24°
Maximum Step	2.95 feet
Maximum Trench	9.8 feet
Fording Depth	3.5 feet without preparation, 18 feet with preparation

#### POWER TRAIN

Engine Type	12-cylinder/V/diesel
Engine hp	700 bhp gross
Maximum Torque/rpm	Not avail
Type Cooling	Liquid
Second Engine	None
Number Gears Forward and Reverse	5 forward/1 reverse (mechanical transmission)
Turning Radius	Skid turns
Driver's Steering Controls	Clutch and brake, using laterals (steering levers)

#### SUSPENSION

Type	Torsion bar, suspended, dead track
Number Shock Absorbers per Side	6
Road Wheels/Support Wheels per Side	7 pairs/3

#### ARMAMENT

Primary Armament	122-mm rifled gun
Length of Tube	17.3 feet
Bore Evacuator/Muzzle Brake	Yes/Multibaffled muzzle brake
Thermal Tube Jacket	No
Types Ammunition/Muzzle Velocity	APHE--3, 116 fps HEAT--2, 940 fps HE--2, 625 fps
Maximum Sustained Rate of Fire	3 rounds/minute
Total Rounds Carried/Rounds in Ready Rack	30/Not avail
Secondary Armament	Coax/14.5-mm; 744 rounds/will pierce 20-mm steel at 1,000 meters
AA Armament	14.5-mm at loader's hatch
Smoke Projection/Number of Dischargers	Injection of diesel fuel into exhaust system

### FIRE CONTROL

Turret Power Control	Electrical and mechanical
By Commander/Gunner	Gunner
Maximum Rate Power Traverse	Not aval
Gun Depression/Elevation	-3°/+17°
Commander's Override/Fire Control Override	Yes/Not aval
Gun Stabilizer/Vertical/Horizontal	Yes/Yes/Yes
Range Finder--Type	Optical, possibly stadiametric reticule in TC sight
Magnification	Not aval
Range	Not aval
Range Setting Device	TC announces range to gunner, gunner applies superelevation
Elevation Quadrant	Not aval
Traverse (Azimuth) Indicator	Not aval
Gunner's Sight (Type/Magnification)	Telescope/7x
Gunner's Secondary Sight (Type/Magnification)	NA
Commander's Sight/Magnification	Window/1x/37.5° field of view; blind zone until 25 feet from cupola
Periscopes or Vision Blocks	Not aval

### NIGHT CAPABILITY

Searchlight/Type	White/IR
Light Source/Planning Range	Not aval
Gunner's Night Sight/Magnification/Range	IR periscope/Not aval/Not aval
Commander's Night Sight/Magnification/Range	IR vision device/Not aval/500 meters
Commander's Searchlight	White and IR (distinguishes T10 from T10M)
IR Driving Light/Driver's Sight/Range	Yes/Yes/50 meters

### NBC PROTECTION

Air filtration system, overpressurization.

### COMMUNICATIONS

The vehicle is commonly configured with the following communications system:

Radio Model	VHF, R113
Band Width/Number Channels/Range	20.0-22.375 MHz
External Phone	Not avail
Intercom	Yes

### EXTRAS

Heaters	Not avail
Hull Escape Hatch	Not avail
Drinking Water Capability	Not avail
Fire Fighting Equipment	Not avail
Fire Warning System	Not avail
Navigation Aids	Not avail
Provisions Made to Prevent Sight/Vision Obscuration from Mud, Water, etc.	Not avail

### FAMILY OF VEHICLES

There are no related combat support vehicles. The T10M comes from the JS series of tanks, and its latest predecessor is the T10. Distinguishing points between these two are that the T10M carries a searchlight for the TC, has a larger rear turret bustle, and sports a 5-baffle muzzle brake instead of the 2-baffle brake of the T10. The T10M also has a bore evacuator and a longer barrel.

### SUMMARY

The T10M has excellent penetration, while it is very hard to defeat, especially frontally. Its gun, however, lacks depression, which limits its ability to select a good firing position. Crew space is severely limited; although Soviet crews are selected from the 5 percentile population. While the engine is proved, it is very difficult to replace. Its slow rate of fire and crude ranging suggests a low first hit probability in a moving fight. Of further interest are its short range, slowness in cross-country travel, and the small load of main gun ammunition. These factors make the tank less than ideal for the exploitation or long offensive campaigns, and deployment may indicate a local defensive posture.



Figure 16-1. T70 (top view).



Figure 16-2. T70 (side view).

June 1973



T70 (Soviet Union)

This new Soviet tank was first noticed in 1970 when a photo of the vehicle appeared in the May issue of Soviet Soldiers.

Most of the information on this tank is unavailable. It can be noticed, however, that the vehicle's front is extremely well-sloped, being almost horizontal. The turret is centered, departing considerably from preceding Soviet designs, which have the turret more forward.

## GLOSSARY

### Ammunition--AP: Armor Piercing

APDS: Armor Piercing Discarding Sabot

APHE: Armor Piercing High Explosive

HE: High Explosive

HEAT: High Explosive Antitank

HEP: High Explosive Plastic

HESH: High Explosive Squash Head

(HEP and HESH are both the same round.

HESH is the British designation, and

HEP is the US designation)

Gallons--United States gallons are used throughout the booklet

Horsepower--Where possible, all horsepower units are US horsepower.

In some cases the horsepower was found in SAE, DIN, or

metric units. Because of varying engine configurations

no readily available conversion factors exist. In any case,

the values of the various units are reasonably close to each other.

Ton--2,000 pounds

Track--

### Dead Versus Live Track

Track is classified as either dead or live. Dead track is connected with a simple "dry" pin in much the same manner as an unsprung door hinge. In order for the door to move one must both open and close it manually. Similarly, all power to move a dead track must come from the engine through the drive sprocket. Live track, on the other hand, has a rubber bushed pin that works like a sprung door hinge. One must open the door but it will shut itself because of the spring. In the same manner, live track has a degree of springiness that assists in moving the track around the compensating idler and the sprocket. Live track is usually heavier and replacement of track blocks difficult. It is quieter and allows for greater speed. Dead track is lighter and replacement of track blocks is simple. Speed of the vehicle is limited and track life is low.

Flat Track-- Track returns over the top of the road wheels. The track does not return on support rollers. The M551 and the M113 both have flat track.

Suspended Track-- The track returns on support rollers. The M60 and the M48 tanks have suspended track.

COUNTRY	TANK	COMBAT WEIGHT (TONS)	LENGTH OF VEHICLE GUN FORWARD (FT)	WIDTH (FT)	HEIGHT (FT)	GROUND PRESSURE (PSI)	ROAD SPEED (MPH)	
FRANCE	AMX 30	39.6	31.17	10.02	9.4	10.9	40.3	
GERMANY	Leopard I	44.25	31.3	10.8	8.7	12.2	40.5	
	Leopard II	PROTOTYPE						
JAPAN	STB	41.9	NA	10.5	7.35	11.4	43	
SWEDEN	STRV-103	43	29.5	11.8	6.24	12.7	31	
SWITZERLAND	PZ 61/68	43	31.2	10.3	8.9	12.1	37	
UNITED KINGDOM	Centurion MK13	57.4	32.33	11.1	9.75	13.3	35	
	Chieftain MK5	62	35	11.5	9.5	12.8	30	
	Vickers	42.5	32.2	10.4	8.9	12.35	33	
USSR	T54	40	29.5	10.75	7.9	11.8	31	25 ft m to
	T55	40	29.5	10.75	7.7	11.8	31	3 ft m to
	T62	40.2	32	10.83	7.83	10.2	30	Sc T
	T10M	55.1	35	11.25	7.9	10.1	31	1 ft m to
	T70	NO INFORMATION AVAILABLE						
USA	M48A3	52	28.5	11.9	10.2	11.8	30	
	M60A1	53	30.9	11.9	10.8	11.1	30	
	M60A2	57.3	23.9	11.9	10.9	12.3	30	
	M60A3	55.6	30.9	11.9	10.8	11.7	30	
	XMI	DESIGN						

## COMPARATIVE DATA CHART

SPEED (MPH)	OPERATING RANGE (MILES)	FUEL CAPACITY (GALS)	MAXIMUM GRADE (%)	MAXIMUM STEP (INCHES)	MAXIMUM TRENCH (FT)	SUSPENSION	ENGINE TYPE	HORSEPOWER
0.3	400	256	60	36	9.5	Torsion bar, dead suspended track	Opposed 12-cylinder diesel	710
0.5	375	319	60	44.9	9.5	Torsion bar, live suspended track	V10 diesel	830
3	310	185	60	39.37	8.2	Hydropneumatic, live track	V10 diesel	750
31	210	254	58	42	7.5	Hydropneumatic, dead suspended track	6-cylinder diesel and gas turbine	730
7	186	165	70	30	8.5	Belleville spring, dead suspended track	V8 diesel	730
35	150	264	60	36	11	Helical spring, dead track suspended	V12 gasoline	650
30	310	234	60	36	10.3	Same as Centurion	Opposed 6 cylinder multifuel	720
33	375	264	60	36	8	Torsion bar, dead suspended track	Opposed 6 cylinder multifuel	650
31	250 mi w/o aux fuel tanks; 375 mi w/aux fuel tanks	215 gal w/o aux fuel tanks; 321 gal w/aux fuel tanks	60	31.2	8.90	Torsion bar, dead flat track	V12 diesel	520
31	310 mi w/o aux fuel tanks; 445 mi w/aux fuel tanks	? w/o aux fuel tanks; 360 gal w/aux fuel tanks	60	31.2	8.90	Same as T54	V12 diesel	580
30	Same as T55	254 gal w/o aux fuel tanks; 360 gal w/aux fuel tanks	60	31.2	9.17	Same as T54	V12 diesel	580
31	155 mi w/o aux fuel tanks; 261 mi w/aux fuel tanks	305	62.5	36	9.8	Torsion bar, dead suspended track	V12 diesel	700
30	310	375	60	36	8.5	Torsion bar, live suspended track	V12 diesel	750
30	310	375	60	36	8.5	Same as M48A3	Same as M48A3	750
30	280	385	60	36	8.5	Same as M48A3	Same as M48A3	750
30	310	375	60	36	8.5	Tube over bar, live suspended track	V12 diesel	750

# COMPARATIVE DATA CHART

	SUSPENSION	ENGINE TYPE	HORSEPOWER	HORSEPOWER PER TON	FORDABILITY (FT)	NBC PROTECTION	PRIMARY ARMAMENT	RATE OF FIRE (RDS PER MIN)	SECONDARY ARMAMENT
5	Torsion bar, dead suspended track	Opposed 12-cylinder diesel	710	17.7	13 w/ prep 4 w/o prep	Yes	105-mm rifled gun	8	Cal .50 coax, 7.62 anti-aircraft mg
5	Torsion bar, live suspended track	V10 diesel	830	18.7	13 w/ prep 4 w/o prep	Yes	105-mm rifled gun	6	7.62-mm coax mg anti-aircraft mg
2	Hydropneumatic, live track	V10 diesel	750	17.9	Unknown	Yes	105-mm rifled gun	6	7.62-mm coax, m AA mg
5	Hydropneumatic, dead suspended track	6-cylinder diesel and gas turbine	730	17	Swims	Yes	105-mm rifled gun	15	2 7.62-mm coax, 7.62-mm AA mg
5	Belleville spring, dead suspended track	V8 diesel	730	17	7.6	Yes	105-mm rifled gun	6	7.5-mm coax, 7.5 anti-aircraft mg
	Helical spring, dead track suspended	V12 gasoline	650	12.5	4.75 w/o prep 9.75 w/ prep	No	105-mm rifled gun	6	Cal .30 coax mg Cal .30 anti-aircraft Cal .50 ranging
3	Same as Centurion	Opposed 6 cylinder multifuel	720	11.6	w/ prep 16 w/o prep 3.5	Yes	120-mm rifled gun	4	7.62-mm coax m 7.62-mm anti-aircraft Cal .50 ranging
	Torsion bar, dead suspended track	Opposed 6 cylinder multifuel	650	15.5	3.75 ft w/o prep 7.33 ft w/ prep swims	Yes	105-mm rifled gun	6	Same as Chieftain
90	Torsion bar, dead flat track	V12 diesel	520	13	4.25 ft w/o prep 13-18 ft w/ prep	Yes	100-mm rifled gun	3-5	7.62-mm coax m anti-aircraft mg, s have a 7.62-mm
90	Same as T54	V12 diesel	580	14.5	Same as T54	Yes	100-mm rifled gun	3-5	Same as T54
17	Same as T54	V12 diesel	580	14.1	4.50 ft w/o prep 13-18 ft w/ prep	Yes	115-mm smooth bore gun	3-4	7.62-mm coax mg 12.7-mm anti-aircraft being retrofitted
8	Torsion bar, dead suspended track	V12 diesel	700	13	18 ft w/ prep 3.5 ft w/o prep	Yes	122-mm rifled gun	3	14.5-mm coax m 14.5-mm anti-aircraft
5	Torsion bar, live suspended track	V12 diesel	750	14.4	4 ft w/o prep 13.5 ft w/ kit	Yes	90-mm rifled gun	6	7.62-mm coax mg Cal .50 anti-aircraft
5	Same as M48A3	Same as M48A3	750	14.1	4 ft w/o prep 13.5 ft w/ kit	Yes	105-mm rifled gun	6	Same as M48A3
5	Same as M48A3	Same as M48A3	750	13.8	Same as M60A1	Yes	152-mm rifled gun launcher	4	Same as M48A3
5	Tube over bar, live suspended track	V12 diesel	750	13.6	Same as M60A1	Yes	105-mm rifled gun	6	Same as M48A3

RATE OF FIRE RDS PER MIN	SECONDARY ARMAMENT	NUMBER OF ROUNDS CARRIED			FIRE CONTROL
		MAIN GUN	AA	COAX	
8	Cal .50 coax, 7.62-mm antiaircraft mg	50	1,950	700	Coincidence range finder linked directly to gun, gunner's sight is telescope; no ballistic computer.
6	7.62-mm coax mg, 7.62-mm antiaircraft mg	60	4,800	7.62-mm for coax and AA mg	Gunner's sight is combination stereoscopic/coinci- dence range finder, with integral computer linked to gun, telescope secondary sight.
6	7.62-mm coax, mg, 12.7-mm AA mg	50	Not aval	Not aval	Laser range finder, commander's periscope linked to gunner's periscope through computer, which is coupled to main gun; gun is stabilized.
15	2 7.62-mm coax, mg's, 7.62-mm AA mg	50	500	1,000	Laser range finder; gunner's sight variable power binocular; no ballistic computer; dual firing/ driving controls.
6	7.5-mm coax, 7.5-mm antiaircraft mg	52	Not aval	Not aval	Coincidence range finder; other information is unavailable.
6	Cal .30 coax mg Cal .30 antiaircraft, Cal .50 ranging mg	66	3,300	3,500 600 for ranging mg	Coax ranging mg; gunner's sight is telescope. No ballistic computer; gun stabilized.
4	7.62-mm coax mg 7.62-mm antiaircraft mg Cal .50 ranging mg	64	3,300	3,500 600 for ranging mg	Coax ranging mg; gunner's sight telescope and periscope. No ballistic computer, gun stabilized; laser range finder on some models.
6	Same as Chieftain	50	2,300	4,500 600 for ranging mg	Same as Centurion, only the gunner's sight is a periscope.
3-5	7.62-mm coax mg, 12.7-mm antiaircraft mg, some models have a 7.62-mm Bow mg	34	500	3,000	Stradiametric range finder, no ballistic computer, gunner's periscope with ballistic reticle, stabilized gun.
3-5	Same as T54	43	Not aval	3,000	Same as T54
3-4	7.62-mm coax mg 12.7-mm antiaircraft mg being retrofitted	44	Not aval	2,500	Same as T54. May also be fitted with a laser range finder.
3	14.5-mm coax mg 14.5-mm antiaircraft mg	30	Not aval	744	Stadiametric range finder, no ballistic computer; gunner's telescope with ballistic reticle stabilized gun.
6	7.62-mm coax mg Cal .50 antiaircraft mg	62	600	6,000	Coincidence range finder coupled to a ballistic computer coupled to main gun; gunner has both telescope and periscope.
6	Same as M48A3	63	900	5,950	Same as M48A3.
4	Same as M48A3	46	1,080	5,500	Laser range finder coupled to ballistic computer, coupled to main gun; gun stabilized.
6	Same as M48A3	63	900	5,950	Same as M60A1 only with laser range finder, solid state ballistic computer and stabilized main gun.

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